IBM Enterprise Storage Server

2105 Model 100 Attachment to ESS Service Guide

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> **Note**
>
> Before using this information and the product it supports, be sure to read the general information under "Notices" on page vii.

First Edition (December 2000)

This edition applies to the first release of the IBM 2105 Enterprise Storage Server and to all following releases and changes until otherwise indicated in new editions.

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Translated Safety Notices

Several countries require that caution and danger safety notices be shown in their national languages.

Translations of the caution and danger safety notices are provided in a separate document, *IBM Storage Solution Safety Notices* book, form number GC26-7229.

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This section contains information about:
* Product recycling for this product
* Environmental guidelines for this product

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Using This Service Guide

This guide is for service representatives who are taught to install and repair theIBM 2105 Enterprise Storage Server. Internal components of this machine are designed and certified to be serviced by trained personnel only.

Where to Start

Start all service actions at "Chapter 2. Entry MAP for All Service Actions" on page 13.

Attention: When performing any service action on the IBM 2105 Enterprise Storage Server, follow the directions given in "Chapter 2. Entry MAP for All Service Actions" on page 13 or from the service terminal. This ensures that you use the correct remove, replace, or repair procedure, including the correct power on/off procedure, for this machine. Failure to follow these instructions can cause damage to the machine and might or might not also cause an unexpected loss of access to customer data.

Limited Vocabulary

This manual uses a specific range of words so that the text can be understood by IBM service representatives in countries where English is not the primary language.

Publications

This section describes the ESS and VSS library and publications for related products. It also gives ordering information.

ESS and VSS Product Library

The ESS and VSS are IBM Enterprise architecture-based products. See the following publications for more information on the ESS and VSS:

- *Enterprise Storage Server Service Guide 2105 Models E10/E20, F10/F20, and Expansion Enclosure, Volume 1* book, GC27–7605

  This is volume 1 of the ESS Service Guide.

- *Enterprise Storage Server Service Guide 2105 Models E10/E20, F10/F20, and Expansion Enclosure, Volume 2* book, GC27–7608

  This is volume 2 of the ESS Service Guide.

- *Enterprise Storage Server Service Guide 2105 Models E10/E20, F10/F20, and Expansion Enclosure, Volume 3* book, GC27–7609

  This is volume 3 of the ESS Service Guide.

- *2105 Model 100 Attachment to ESS Service Guide* book, SY27-7615

  This guide is for service representatives who are taught to install and repair a VSS attached to an ESS.

- *Enterprise Systems Link Fault Isolation* book, form number SY22-9533

- *Maintenance Information for S/390 Fiber Optic Links (ESCON, FICON, Coupling Links, and Open System Adapters)* book, form number SY27-2597.

- *IBM Enterprise Storage Server Introduction and Planning Guide* book, GC26-7294

  This book introduces the product and lists the features you can order. It also provides guidelines on planning for installation and configuration of the VSS.

- *IBM Versatile Storage Server User's Guide* book, SC26-7295

  This book provides instructions for setting up and operating the VSS.
- *IBM Versatile Storage Server SCSI Command Reference* book, SC26-7297

  This book describes the functions of the VSS and gives reference information such as channel commands, sense bytes, and error recovery procedures.
- *Enterprise Storage Serve Parts Catalog* book, S127-0974
- *IBM Storage Solutions Safety Notices* book, GC26-7229

  This book provides translations of the Danger and Caution notices used in the VSS publications.
- *IBM Versatile Storage Server Web Users Interface Guide* book, SC26-7346
- *IBM Versatile Storage Server Host Systems Attachment Guide* book, SC26-7296
- *IBM Versatile Storage Server System/390 Command Reference* book, SC26-7298
- *DFSMS/MVS Software Support for the IBM Enterprise Storage Server* book, SC26-7318
- *IBM Enterprise Storage Server Quick Configuration Guide* book, SC26-7354
- *IBM Enterprise Storage Server Configuration Planner* book, SC26-7353

  This book provides work sheets for planning the logical configuration of ESS. This book is only available on the product Web site:
      http://www.ibm.com/storage/ess

Ordering Publications

All of the above publications are available on a CD-ROM that comes with the VSS. You can also order a hard copy of each of the publications. For additional CD-ROMs, order:
- ESS Service Documents CD-ROM, SK2T-8771
- ESS Customer Documents CD-ROM, SK2T-8770

Related Publications

The following publications provide information on software products that the IBM Versatile Storage Server supports:
- *IBM Subsystem Device Driver* book, SH26-7291
- *IBM Storage Area Network Data Gateway Installation and User's Guide* book, SC26-7304
- *IBM Advanced Copy Services* book, SC35-0355
- *IBM S/360, S/370, and S/390 Channel to Control Unit Original Equipment Manufacture's Information* book, SH26-7291

Web Sites

- IBM Storage home page:
      http://www.storage.ibm.com/
- IBM Enterprise Storage Server home page:
      http://www.ibm.com/storage/ess
      http://www.storage.ibm.com/hardsoft/product/refinfo.htm

Other Related Publications

The following is a list of other related books.
   7133 Model D40 Serial Disk Systems Service Guide book, GY33-0192
   7133 Model D40 Serial Disk System Installation Guide book, GA33-3279

7133 SSA Disk Subsystem Service Guide book, SY33-0185

7133 Models 010 and 020 SSA Disk Subsystem Installation Guide book,
GA33-3260

IBM Versatile Storage Server Service Guide, 2105 Models B09 and 100 book,
SY27-7603

IBM Input/Output Equipment, Installation Manual–Physical Planning ,
GC22-7064

IBM Storage Solutions Safety Notices , GC26-7229

Electrical Safety for IBM Customer Engineers S229-8124

Chapter 1. Reference Information

2105 Enterprise Storage Server (ESS) Attachment Overview

This section describes the IBM 2105 Versatile Storage Server attachment components, models, features, and functions.

Attaching the 2105 Model 100 ESS to the 2105 Model Exx/Fxx ESS allows the customer to use their existing 7133 drawers.

The 2105 supports:
- 7133 Model 020 drawers, with 4.5 and 9.1 GB DDM
- 7133 Model 040 drawers, with 4.5, 9.1, 18.2, and 36.4 GB DDM)

2105 Subsystem (front View)

| Rack 1
(R1-) | Rack 2
(R2-) | Rack 3
(R3-) |

2105 Model Exx/Fxx   2105 Model 100   2105 Model 100
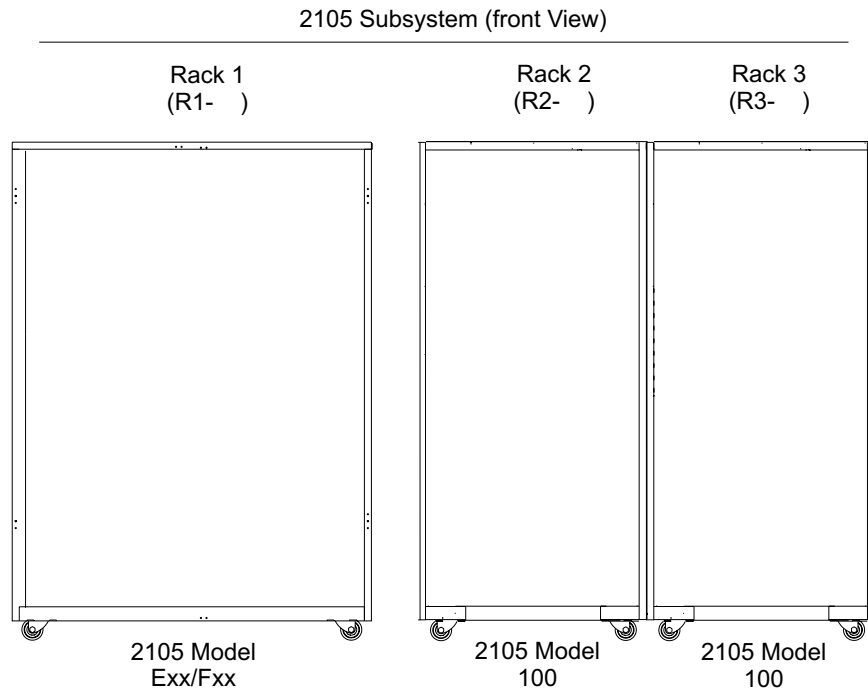
Figure 1. 2105 Model Exx/Fxx ESS with attached 2105 Model 100 ESS Racks (s008856n)

2105 Models

This section describes the 2105 ESS model.

The 2105 ESS can be installed as a single-rack system or a multiple-rack system. The rack models available with the 2105:

- First 2105 Model 100 (FC 1121)
- Second 2105 Model 100 (FC 1122)

Both racks support the 7133 Model 020 and 040 drawers. You can place your existing 7133 drawers in the 2105 Model 100 racks.

2105 Model 100 Rack

The 2105 Model 2105 Model 100 is an extension rack, it can support up to six drawers and includes dual power supplies. Two redundant mainline power cables provide input to the power supplies which provide power to each drawer. The Model 100 supports single-phase or three-phase input power.

The DDMs can be either 4.5, 9.1, 18.2, or 36.4 GB capacity.

Note: All DDMs within an array must be the same type and have the same capacity. All DDMs on a single SSA loop must be of the same capacity.

Figure 2 on page 3 shows the Model 2105 Model 100 rack.

You can combine one or two 2105 Model 100 racks (FC1121 and 1122). In the two 2105 Model 100 rack configuration, the racks bolt together, using the 40 mm (1.6 in) spacer.

Model 100 (front)   Model 100 (front)
(FC 1121)   (FC 1122)
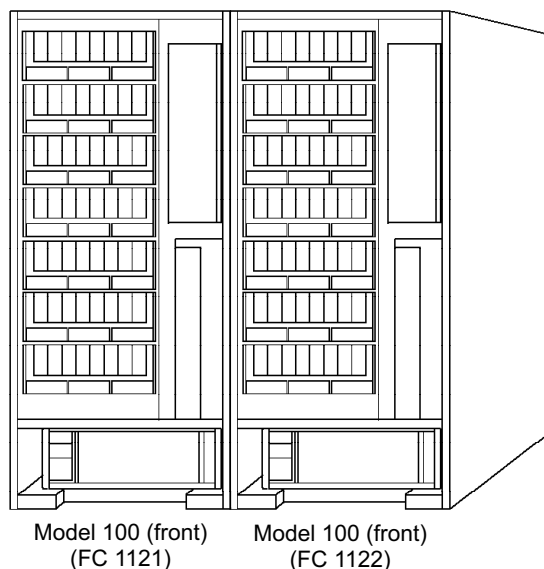
Figure 2. 2105 Model 100 Racks (t008976m)

Multiple Rack Configurations

This section lists the 2105 multiple rack configurations. The 7133 Model 020 and 040 drawers can be used in multiple rack configurations.

The ESS can only be attached to the 2105 Model Exx/Fxx ESS with FC 1121. A second 2105 Model 100 can be attached with FC 1122. You can combine up to a maximum of 12 drawers with two 2105 Model 100s. Ensure that the drawers meet minimum hardware requirements:

* Three fan-and-power-supply assemblies (Model 020 drawer)
* Three fan assemblies (Model 040 drawer)
* Two power supply assemblies (Model 040 drawer)
* 4.5, 9.1, 18.2, or 36.4 GB DDM
* 16 DDMs in each drawer

Note: The new 2105 Model 100 racks include the SSA device cables.

Adding and Removing Drawers and Racks

Drawers installed in a 2105 Model 100:

* Do not support 48 volt power supply
* Have no DDM locks
* Have no front cover

You can attach other customer owned 7133 Model 020 or 040 drawers. The drawers must meet the following minimum hardware requirements:

* Three fan-and-power-supply assemblies, not 48V (Model 020 drawer)
* Three fan assemblies (Model 040 drawer)
* Two power supply assemblies (Model 040 drawer)
* 4.5, 9.1, 18.2, or 36.4 GB DDM
* 16 DDMs in each drawer
* Covers must be removed

Information

See "Installing Existing 7133 Drawers in a 2105 Rack".

Drawer Placement
The 2105 subsystem supports up to twelve 7133 drawers. There is a maximum of six drawers in each 2105 Model 100 rack.

Installing Existing 7133 Drawers in a 2105 Rack
To install existing 7133 drawers into a 2105 Model 100 rack, the drawer must be updated with the ″7133 Model 020 and D40 Requirements for 2105 Installations″ instruction list service offering.

Power Control
Power is supplied through two mainline power cables with either 50 amp (single phase) or 50/60 amp (three phase) connectors. Each mainline power cable can provide 100% of the needed power, both power cables must be connected.

The battery power feature (FC 1100) is required on the 2105 Model 100 racks attached to an ESS subsystem. The battery is designed to provide reserve power to assist with system shutdown should a catastrophic site power failure occur. The battery feature must be installed in all racks in a 2105 subsystem.

SSA DASD Drawer Reference Information

The 7133 Serial Storage Architecture (SSA) DASD drawer are used in the 2105 Model 100 racks. The 7133 SSA DASD Model 020 and 040 drawers can be installed in the 2105 Model 100 Electrical Industries Association (EIA) 19 inch racks.

Each SSA DASD drawer must contain 16 SSA disk drive modules (DDMs), eight at the front and eight at the rear of the drawer.

Each 7133 Model 20 drawer has three fans and power supplies that provide all of the power and cooling for the drawer.

Each 7133 Model 40 drawer has three fans and two power supplies that provide all of the power and cooling for the drawer.

The DDMs in a drawer are connected to each other in (SSA) strings of four DDMs, two strings at the front and two strings at the rear. These strings can be connected to: strings in the same drawer, strings in other drawers, or to SSA device cards.

A SSA DASD drawer can be disconnected from its SSA device cards while the 2105 is operating. Most of the SSA DASD drawer field replaceable units (FRUs) can be replaced while the SSA DASD drawer and 2105 are running.

Use the following list to find a description of the SSA DASD drawer or DDM indicators and switches:
- "SSA DASD Model 020 Drawer Indicators and Power Switch"
- "SSA DASD Model 040 Drawer Indicators and Switches" on page 6
- "SSA DASD Model 020 Drawer Disk Drive Module Indicators" on page 8
- "SSA DASD Model 040 Drawer Disk Drive Module Indicators" on page 10

SSA DASD Model 020 Drawer Indicators and Power Switch

The SSA DASD Model 020 drawer has indicators that show the status of the drawer. It also has a power switch. Each DDM has indicators that show the status of that DDM.

Use Figure 3 on page 6 to locate the following indicators and switches.

1 Power Switch (On/Off) This switch controls the internal dc power that is supplied to the SSA DASD drawer by the fan-and-power-supply assemblies.

Note: To power on the SSA DASD Model 020 drawer, press and release the power switch.

Repeat the action to power off the dc power. When the dc power is off, mainline power is still present in the fan-and-power-supply assemblies if the SSA DASD drawer is connected to the mainline-power source.

The front cover includes a flap that covers the Power switch to prevent accidental operation. On SSA DASD Model 020 drawer, the flap pivots to the right to open.

2 SSA DASD Drawer Power Indicator This green indicator is on when the power switch has been pressed to power on the dc voltage, and the dc voltage is present in the SSA DASD drawer.

3 SSA DASD Drawer Check Indicator This amber indicator comes on if a failure occurs in the SSA DASD drawer subsystem. The subsystem might be able to continue operating satisfactorily although the failure of a particular part has been detected.

4 Power Card Indicator This green indicator is on when electrical power is present on the card. The indicator is not visible when the front cover is installed.

5 Fan-and-Power Check indicator This amber indicator comes on and stays on if dc output from the power supply part of the fan-and-power-supply assembly fails or is disabled.

If the power supply fails completely, the fan-and-power indicator is powered on from one of the other fan-and-power-supply assemblies in the SSA DASD drawer. The indicator blinks if the fan fails.

6 Power Indicator This green indicator is on when mainline electrical power is present in the fan-and-power-supply assembly.

7 Link Status (Ready) Indicator This green indicator shows the status of the port (for example, port 1) through which the bypass card is connected to the SSA device card:

– **Indicator Permanently On** The interface through the bypass card is fully operational.

– **Indicator Blinking** *(two seconds on, two seconds off)* The interface through the bypass card is not operational.

– **Indicator Off** The card is in Bypass state or in Forced Inline mode.

8 Mode Indicator This indicator shows in which mode the bypass card is operating.

– **Indicator Permanently On** *(Amber)* The bypass card is switched to Bypass state.

– **Indicator Permanently On** *(Green)* The bypass card is jumpered for Forced Inline mode.

– **Indicator Off** The bypass card is switched to Inline state.

9 Link Status (Ready) indicator This green indicator shows the status of the port (for example, port 2) through which the bypass card is connected to the SSA device card:

– **Indicator Permanently On** The interface through the bypass card is fully operational.

SSA DASD Drawer Reference Information

  – **Indicator Blinking** *(two seconds on, two seconds off)* The interface through the bypass card is not operational.
  – **Indicator Off** The card is in Bypass state or in Forced Inline mode.
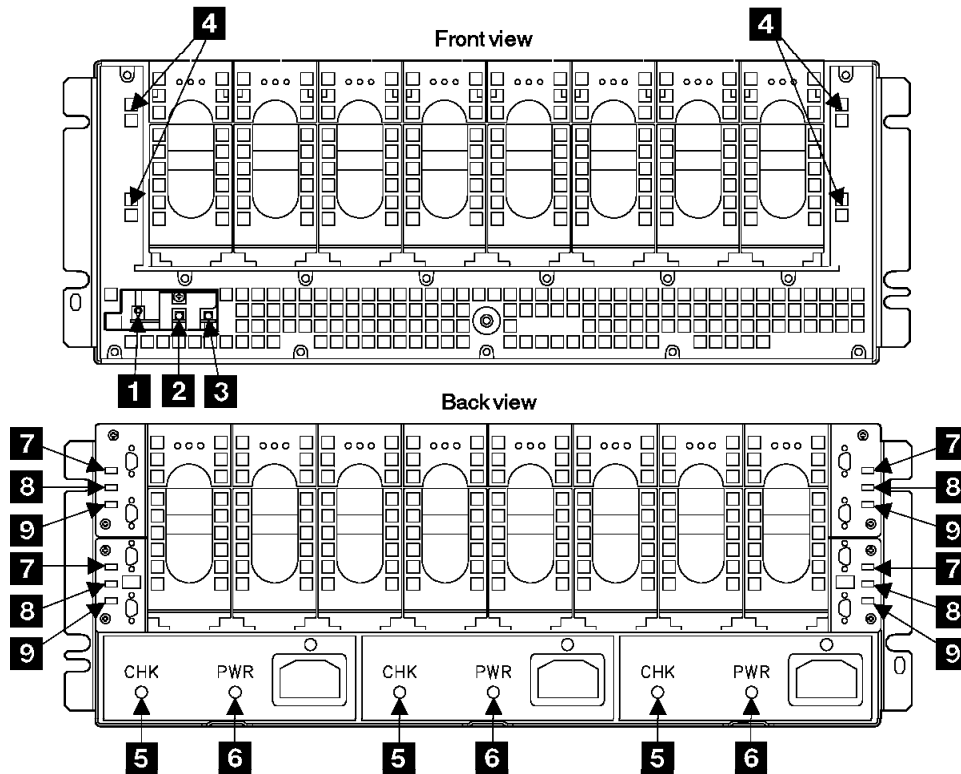
Figure 3. SSA DASD Model 020 Drawer Indicators and Power Switch (t007290n)

SSA DASD Model 040 Drawer Indicators and Switches

The SSA DASD Model 040 drawer has indicators that show the status of the drawer. Each DDM has indicators that show the status of that DDM.

Use Figure 4 on page 8 to locate the following indicators and switches.

1 **Controller Card Indicator** This amber indicator is on when the controller card fails.

2 **Fan Power Indicator** This green indicator is on when dc voltage is present at the fan.

3 **Fan Check Indicator** This amber indicator comes on and remains on when the fan fails.

7 **PWR/FAULT RESET Switch** This switch switches off the dc output voltage from the power supply. To switch off the dc voltage, pull the switch out, then push it down. To switch on the dc voltage, pull the switch out, then push it up.

If the SSA DASD Model 040 drawer has a serious power problem, the power supply can become latched off. By switching this switch Off then On, you can reset the power supply.

8 **PWR Indicator** This green indicator comes on when mainline power is present in the power supply.

6 **CHK/PWR-GOOD Indicator** This indicator has two colors that show power supply status:

– This indicator shows green when the dc output from the power supply is active (good).

– This indicator shows amber when the dc output from the power supply fails.

■4 **Link Status (Ready) Indicator** This green indicator shows the status of the port (for example, port 1) through which the bypass card is connected to another device:

– **Permanently On,** The path through this port is operational.

– **Flashing,** The path through this port is not operational.

– **Off,**, one of the following conditions exists:

- The path through this port is not operational.

- The card is switched into Bypass state (mode light is on amber)

- The card is jumpered for Forced Inline mode (mode light is on green)

■4 **Mode Indicator** This indicator has two colors that show which mode the bypass card is operating in:

– **Permanently On (amber),** the bypass card is switched to bypass state.

– **Permanently On (green),** the bypass card is jumpered for forced inline mode.

– **Off,**, the bypass card is switched to inline mode.

The following table summarizes the various states of the three bypass card lights:

Table 1. Summary of Bypass Card Indicators

Operating Mode	Status	Link Status Light-1	Mode Light	Link Status Light-2
Automatic	Inline	On	Off	On
Automatic	Bypass	Off	Amber	Off
Forced Inline	Inline	Off	Green	Off
Forced Bypass	Bypass	On	Amber	On
Forced Open	Open	Off	Off	Off
Jumpered Forced Inline	Inline	Off	Green	Off

SSA DASD Drawer Reference Information

Front View

Back View
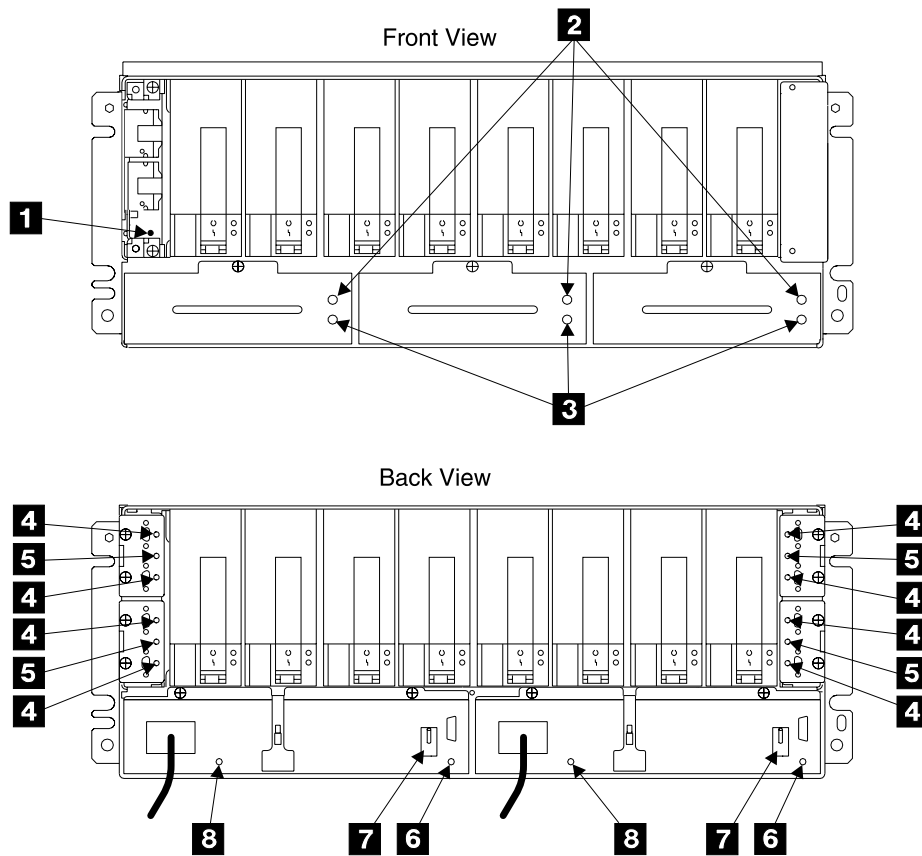
Figure 4. SSA DASD Model 040 Drawer Indicators and Switches (t007661p)

Disk Drive Module Indicators

The DDM indicators at the front or rear of the SSA DASD Model 020 or 040 drawer drawers are visible by opening the front or rear door of the 2105.

SSA DASD Model 020 Drawer Disk Drive Module Indicators

Use Figure 5 on page 9 to locate the following indicators.
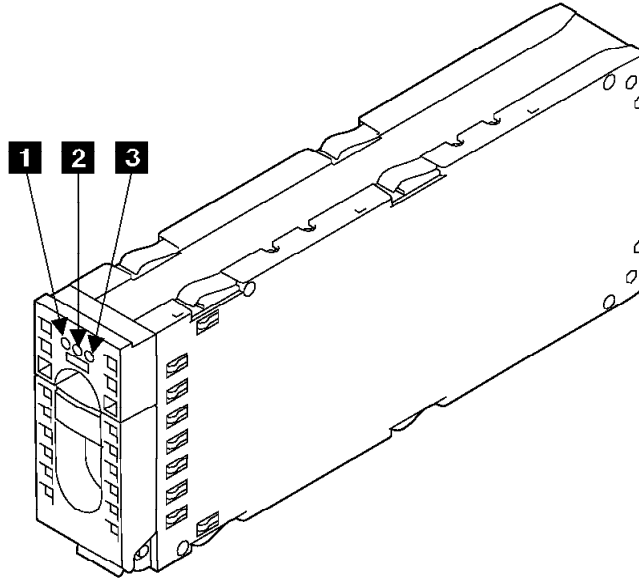
Figure 5. SSA DASD Model 020 Drawer Disk Drive Module Indicators (t007383m)

◢1◣ **Power Indicator** This green indicator is on when dc voltage is present and inside the specified limits.

◢2◣ **Ready Indicator** This green indicator shows the following conditions:

– **Indicator Off** Both SSA links are inactive because one of the following conditions exists:

  - The DDMs and bypass card that are logically on each side of, and next to, this DDM are not connected or are missing.
  - The DDMs or DDM and bypass card that are logically on each side of, and next to, this DDM are inactive.
  - A bypass card that is in the loop is inactive.
  - A power-on self-test (POST) is running on this DDM.

– **Indicator Permanently On** Both SSA links are active, and the DDM is ready to accept commands from the using system. The Ready indicator does not show that the motor of the DDM is spinning. The DDM might be waiting for a Motor Start command, or might have received a Motor Stop Command.

– **Indicator Slowly Blinks** *(two seconds on, two seconds off)* Only one SSA link is active.

– **Indicator Blinks Fast** *(five times per second)* The DDM is active with a command in progress.

◢3◣ **Check Indicator** This amber indicator shows the following conditions:

– **Indicator Off** Normal operating condition.

– **Indicator Permanently On** One of the following conditions exists:

  - An unrecoverable error that prevents the normal operation of the SSA link has been detected.
  - The power-on self-tests (POSTs) are running or have failed. The indicator comes on as soon as the DDM is powered on, and goes off when the POSTs are complete. If the indicator remains on for longer than one minute after the DDM is powered on, the POSTs have failed.
  - Neither SSA link is active.

- The DDM is in Service mode, and can be removed from the SSA DASD drawer.
  – **Indicator Blinking** The Check indicator has been set by a service aid to identify the position of a particular DDM.

SSA DASD Model 040 Drawer Disk Drive Module Indicators
Use Figure 6 to locate the following indicators.
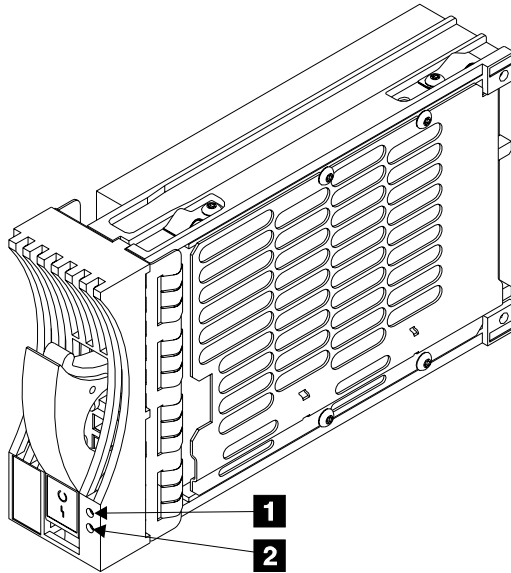
Figure 6. SSA DASD Model 040 Drawer Disk Drive Module Indicators (t007660m)

1 **Ready Indicator** This green indicator shows the following conditions:
- **Indicator Off** Both SSA links are inactive because one of the following conditions exists:
  - The DDMs and bypass card that are logically on each side of, and next to, this DDM are not connected or are missing.
  - The DDMs or DDM and bypass card that are logically on each side of, and next to, this DDM are inactive.
  - An SSA attachment that is in the loop is inactive.
  - A power-on self-test (POST) is running on this DDM.
- **Indicator Permanently On** Both SSA links are active, and the DDM is ready to accept commands from the using system. The Ready indicator does not show that the motor of the DDM is spinning. The DDM might be waiting for a Motor Start command, or might have received a Motor Stop Command.
- **Indicator Slowly Blinks** *(two seconds on, two seconds off)* Only one SSA link is active.
- **Indicator Blinks Fast** *(five times per second)* The DDM is active with a command in progress.

2 **Check Indicator** This amber indicator shows the following conditions:
- **Indicator Off** Normal operating condition.
- **Indicator Permanently On** One of the following conditions exists:
  - An unrecoverable error that prevents the normal operation of the SSA link has been detected.

- The power-on self-tests (POSTs) are running or have failed. The indicator comes on as soon as the DDM is powered on, and goes off when the POSTs are complete. If the indicator remains on for longer than one minute after the DDM is powered on, the POSTs have failed.
- Neither SSA link is active.
- The DDM is in Service mode, and can be removed from the SSA DASD drawer.
  - **Indicator Blinking** The Check indicator has been set by a service aid to identify the position of a particular DDM.

Internal Connections, SSA DASD Model 020 and 040 Drawer

Inside the SSA DASD drawer, the DDMs are connected in strings of four DDMs. These strings are connected to the external SSA connectors at the back of the SSA DASD drawer.

SSA DASD Model 020 and 040 Drawer Internal Connections

Table 2 summarizes the relationship between the DDM strings and the external SSA connectors.
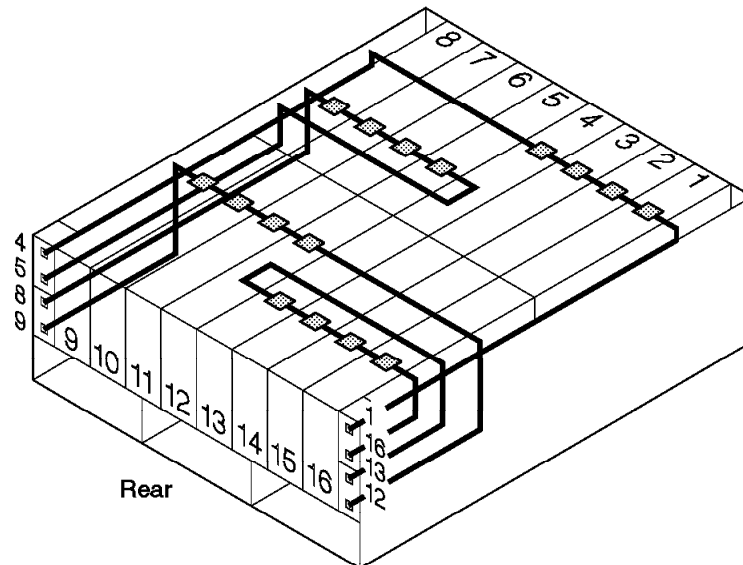
Figure 7. SSA DASD Model 020 and 040 Drawer Internal SSA Connections (t007304m)

Table 2. Relationship between Strings and Connectors of SSA DASD Model 020 and 040 drawer

Disk Drive Modules	SSA DASD Model 020 and 040 Drawer Connectors
Back DDMs 13 through 16	J13 and J16
Back DDMs 9 through 12	J9 and J12
Front DDMs 5 through 8	J5 and J8
Front DDMs 1 through 4	J1 and J4

Special Tools

- SSA screwdriver tool (P/N 32H7059)
- Bay service plate (P/N 08L7122)

Special Tools

Chapter 2. Entry MAP for All Service Actions

Start all service actions for the IBM 2105 subsystem 2105 Model 100 rack or SSA DASD drawer here. For entries not listed here, use the Start chapter in the 2105 Model Exx/Fxx service guide that the 2105 Model 100 attaches to. See ″Entry MAP for All Service Actions″ in chapter 2 of the *Enterprise Storage Server Service Guide, Volume 1*.

Select the type of action you want to perform from Table 3 below.

Table 3. Entry MAP for All Service Actions

If you are here to:	Go to:
INSTALL	
ESS 2105 Model 100 rack	"Attaching the 2105 Model 100 to a 2105 Model Exx/Fxx Unit" on page 94 **Note:** Requires FC 1121 or 1122
7133 Drawer (Customer supplied and previously used)	Adding previously used 7133 device drawers must be checked for compatibility. Use the ″7133 Model 020 and D40 Requirements for 2105 Installations″ instruction list service offering in the *IBM Enterprise Storage Server Introduction and Planning Guide* book, form number GC26-7294. When the requirements have been met, go to "Physically Installing a 7133 Device Drawer" on page 137.
REMOVE	
ESS 2105 Model 100 rack	Removing a 2105 Model 100 from an existing 2105 subsystem requires an RPQ.
7133 Drawer	Removing a 7133 drawer from an existing 2105 subsystem requires a separate RPQ.
Relocate 2105 Model 100 rack	"Relocating a 2105 Model 100" on page 163
ANALYZE and REPAIR a SERVICE REQUEST	
Display and repair a problem with the service terminal	Refer to the Start chapter in the 2105 Model Exx/Fxx service guide that the 2105 Model 100 attaches to. See ″Entry MAP for All Service Actions″ in chapter 2 of the *Enterprise Storage Server Service Guide, Volume 1*.
Visual symptom	"MAP 1320: Isolating Problems Using Visual Symptoms" on page 15
Power and cooling	"MAP 2020: Isolating Power Symptoms" on page 20
Power on Problems	"MAP 2020: Isolating Power Symptoms" on page 20
Replace a FRU without using a problem log.	Refer to the Start chapter in the 2105 Model Exx/Fxx service guide that the 2105 Model 100 attaches to. See ″Entry MAP for All Service Actions″ in chapter 2 of the *Enterprise Storage Server Service Guide, Volume 1*.
INFORMATION	
Machine overview	"Chapter 1. Reference Information" on page 1

Start

Service strategy	Refer to the Start chapter in the 2105 Model Exx/Fxx service guide that the 2105 Model 100 attaches to. See ″Entry MAP for All Service Actions″ in chapter 2 of the *Enterprise Storage Server Service Guide, Volume 1*.
Locations and FRUs	"Chapter 7. 2105 Model 100 Locations" on page 173
Determine ESD procedures	"Working with ESD-Sensitive Parts" on page 34
Determine standard tools needed	"Standard Tools Needed" on page 34
SSA DASD Drawer indicators and switch	"SSA DASD Drawer Reference Information" on page 4
2105 Model 100 maintenance agreement qualification	"Chapter 12. Safety Check" on page 203

Chapter 3. Problem Isolation Procedures

MAPs 1XXX: General Isolation Procedures

The isolate procedures in the MAP 1XXX group of the Isolate chapter are general
MAPs that deal with reported errors and error logs.

MAP 1320: Isolating Problems Using Visual Symptoms

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of
the service terminal or other service guide procedures. Failure to follow this
attention can cause customer operations to be disrupted.

Description
This visual symptom MAP is useful if:

- You suspect there is a problem but have no specific failure information. This table
  can quickly get you to a procedure for your symptom.

- There is a problem logged with no specific details. For example, a power
  problems can be logged but it can only be isolated with visual symptoms.

MAP 1320: Visual Symptoms

Isolation

Locate your visual symptom in the following table then follow the description and actions there.

Table 4. 2105 Model 100 Visual Symptom Table

Visual Symptom	Description and Action
2105 Model 100 operator panel Line Cord indicators may indicate a problem.	Description: A rack R2 or R3 operator panel Line Cord indicator is on with a normal power on. A rack R3 Line Cord indicator will blink slowly if an error is being reported. A rack R2 Line Cord indicator will not blink slowly if an error is being reported. Check the BPC Good indicators in both rack R2 and R3. If one or more of the BPC indicators is blinking, go to "MAP 2350: Isolating BPC (BPS) Good Indicator Blink Codes" on page 21. **Note:** "MAP 2000: Entry for Visual Power Symptoms" on page 19 has a more complete explanation of BPS error detection. Action: Go to "MAP 2000: Entry for Visual Power Symptoms" on page 19.
BPS, BPC Good indicator is blinking	Description: A BPC Good indicator blinks when an error condition has been detected. Go to "MAP 2350: Isolating BPC (BPS) Good Indicator Blink Codes" on page 21 **Note:** "MAP 2000: Entry for Visual Power Symptoms" on page 19 has a more complete explanation of BPS error detection.
BPS indicators are not all on.	Description: All BPS indicators are on with a normal power on. There are two possible reasons why an indicator may be off: 1. There is an error condition that is internal or external to the BPS. 2. The BPS may still be powering on. If there is an error, it will be reported by that BPS or a BPS that it can directly communicate with. The error is reported by blinking the operator panel Line Cord indicator. **Note:** A problem record should have been logged. Action: Go to "MAP 2000: Entry for Visual Power Symptoms" on page 19.
2105 Model 100 unexpectedly powered off.	**Note:** See "Bulk Power Supply (BPS) Component Locations" on page 174 for the location of the BPC and BPD in the BPS. Description: The 2105 Model 100 was found powered off when it should have been on. If it was: • Powered off with the Local Power switch, the BPS BPD ENBLD indicator will be on. • Powered off by the Unit Emergency Switch or a UEPO condition that is still present, the BPS BPD indicator will be on. The operator panel Line Cord indicators will blink slowly. • Powered off by the Unit Emergency Switch which was then returned to the on position, the BPS BPD ENBLD indicator will be off. • Powered off by a total loss of customer input power, all BPS indicators will be off. If the customer power was restored the UEPO PWR, UEPO CMPLT and BPC GOOD indicator will be on and the BPD ENBLD indicator will be off. Action: Go to "MAP 2000: Entry for Visual Power Symptoms" on page 19.

Table 4. 2105 Model 100 Visual Symptom Table (continued)

Visual Symptom	Description and Action
At the Front of The SSA DASD Drawer, Model 020 drawer: • Green SSA DASD drawer power indicator is off, or • Amber SSA DASD drawer check indicator is on or blinking. For indicator locations, see Figure 3 on page 6.	Description during normal operation: • Green drawer power indicator is on and • Amber drawer check indicator is off. Action: if not as described above, go to MAP 3151 in the service guide for the 2105 Model Exx/Fxx that this 2105 Model 100 is attached to.
At the front of the SSA DASD drawer, Model 020 drawer: • Any green power indicators is off. **Note:** Indicators may be obscured by internal cabling. For indicator locations, see Figure 3 on page 6.	Description during normal operation: • All green power card indicators are on. Action: if not as described above, go to MAP 3354 in the service guide for the 2105 Model Exx/Fxx that this2105 Model 100 is attached to.
At the rear of the SSA DASD drawer, Model 020 drawer: • Green power indicator is off, or • Amber fan-and-power CHK (check) indicator is on or blinking. For indicator locations, see Figure 3 on page 6.	Description during normal operation: • Green power indicators is on and • Amber check indicators is off. Action: if not as described above, go to MAP 3151 in the service guide for the 2105 Model Exx/Fxx that this 2105 Model 100 is attached to.

At the rear of the SSA DASD drawer Model 020 drawer only:
 	
Lights on the bypass card:
• Link status (ready) indicators (green)
• Mode indicator (amber/green)
 	
For indicator locations, see Figure 3 on page 6.
	Description during normal operation:
	
	• If there are two SSA cables connected adjacent to indicators,
	  – Link status (ready) indicators is always on green
	  – Mode indicator amber is always on.
	• If there are no SSA cables connected adjacent to lights,
	  – Link status (ready) indicators are off
	  – Mode indicator amber is on.
	
	Action: if not as described above, go to MAP 3520 in the service guide for the 2105 Model Exx/Fxx that this 2105 Model 100 is attached to.

At the rear of the SSA DASD drawer Model 020 drawer only:
 	
Lights on the bypass card:
• Green link status indicators
 	
For indicator locations, see Figure 3 on page 6.
	Description during normal operation:
	
	• If there are two SSA cables connected adjacent to an indicator.
	  – Link status indicators is always on green
	  – Mode indicator amber is always on.
	• If there are no SSA cables connected adjacent to an indicator,
	  – Link status (ready) indicators are off
	
	Action: if not as described above, go to MAP 3520 in the service guide for the 2105 Model Exx/Fxx that this 2105 Model 100 is attached to.

MAP 1320: Visual Symptoms

Table 4. 2105 Model 100 Visual Symptom Table (continued)

Visual Symptom	Description and Action
At the front of the SSA DASD drawer Model 040 drawer: • Controller check indicator (amber) is on, or • Fan check indicator (amber) is on, or • Fan power indicator (green) is off. For indicator locations, see "Chapter 1. Reference Information" on page 1.	Description during normal operation: • Controller check indicator (amber) is off, and • Fan check indicator (amber) is off, and • Fan power indicator (green) is on. Action: if not as described above, go to MAP 3390 in the service guide for the 2105 Model Exx/Fxx that this 2105 Model 100 is attached to.
At the rear of the SSA DASD drawer Model 040 drawer: • Power supply CHK/PWR Good indicator is on (amber), or • Power supply CHK/PWR Good indicator is off, or • Power supply PWR indicator is off (green). For indicator locations, see "Chapter 1. Reference Information" on page 1.	Description during normal operation: • Power supply CHK/PWR Good indicator is on (green), and • Power supply PWR indicator is on (green). Action: if not as described above, go to MAP 3390 in the service guide for the 2105 Model Exx/Fxx that this 2105 Model 100 is attached to.
Lights on disk drive modules, Model 020 drawer: • Green DDM power indicator is off, or • Green DDM ready indicator is off, or • Amber DDM check indicator is on. For indicator locations, see Figure 5 on page 9.	Description during normal operation: • Green DDM power indicator is on, and • Green DDM ready indicator is on, and • Amber DDM check indicator is off Action: if not as described above, go to MAP 3520 in the service guide for the 2105 Model Exx/Fxx that this 2105 Model 100 is attached to.
Lights on disk drive modules, Model 040 drawer: • Green DDM ready indicator is off or • Amber DDM check indicator is on. For indicator locations, see "Chapter 1. Reference Information" on page 1.	Description during normal operation: • Green DDM ready indicator is on and • Amber DDM check indicator is off Action: if not as described above, go to MAP 3520 in the service guide for the 2105 Model Exx/Fxx that this 2105 Model 100 is attached to.

MAP 1500: Ending a Service Action

Go to MAP 1500 in the service guide for the 2105 Model Exx/Fxx that this 2105 Model 100 is attached to.

MAPs 2XXX: Power and Cooling Isolation Procedures

Procedures in the MAP 2XXX group of the Isolate chapter cover the power and cooling areas of the 2105 Model 100 units.

MAP 2000: Entry for Visual Power Symptoms

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

This MAP is the entry point for visual isolation of 2105 power problems.

Note: See "Bulk Power Supply (BPS) Component Locations" on page 174 for the location of the BPC and BPD in the BPS.

Description
The BPS can detect the following:
- BPS internal logic and power errors
- Unit Emergency switch set to off
- UEPO fault condition to one or both BPSs in the rack
- Loss of communication with other BPS in the rack
- Loss of communication with the BPS in an attached rack
- A missing drawer cable, communication cable, or battery cable as compared to the other BPS in the rack
- An attached 2105 Model 100 BPS has detected and is reporting an error condition
- A battery fault

The BPC microprocessor analyzes the type of error and blinks the BPC Good indicator a unique number of times for each error type. The BPS cannot report the details of the error to the microcode so only a general power problem log can be created. The BPC ready indicator LED is used to blink a power error code. More than one power error code can be blinked in sequence. The blinks will be reset by a power on reset. This causes the BPC microprocessor to check for errors that are still present. After the power on reset, it will build a new list of error codes to blink. If the error has been repaired, its error code will no longer be blinked. A power on reset occurs when:
- Customer power is first turned on to the BPS.
- The 2105 Model Exx/Fxx operator panel Local Power switch is momentarily pressed to the on (|, up) position, even if already powered on. This creates a power on request to all the BPSs which causes the BPSs to do a power on reset operation. This allows you to keep checking if the error has been fixed as you go through the isolation procedure.

   Note: The 2105 must remain powered off for at least two minutes before it can be powered on.

If more than one and 2105 Model 100 are installed, the BPS detecting the failure will report it to the BPSs that are cabled to the 2105 Model Exx/Fxx RPC card. The BPS could be reporting a power error it detected internally. It could also be passing on a power error condition that another BPS detected.

MAP 2000: Visual Power Symptoms

Isolation
This procedure will isolate the visual symptom to one or more FRUs that will then be replaced until the error condition is repaired.

Find your visual power symptom in the following table and do the indicated action.

Table 5. Visual Power Symptom Isolation

Visual Power Symptom	Action
Any 2105 Model 100 BPS, BPC Good indicators are blinking slowly.	Go to "MAP 2350: Isolating BPC (BPS) Good Indicator Blink Codes" on page 21.
One operator panel Line Cord indicator is off and the other is on, check to see if all the BPS indicators are off.	Go to "MAP 2060: Isolation with All BPS Indicators Off". **Note:** Line Cord 0 indicator is for the front BPS. Line Cord 1 indicator is for the rear BPS.

MAP 2020: Isolating Power Symptoms

Attention: This is *not* a stand-alone procedure.

Customer disruption may occur if microcode and power boundaries are not in the proper conditions for this service action. Ensure that you start all service activities in "Chapter 2. Entry MAP for All Service Actions" on page 13 volume 1 of this book.

Description
Most power symptoms create a related problem log which should be used to start the problem repair. If a related problem log was not created, the table below can be used to start the repair.

Isolation

Table 6. Created by ActiveSystems 1/6/00. Entity not defined Power Symptom Table

Power Symptom	Description and Action
Visual power symptoms.	Description: A problem record is created for most power problems. Action: Use the service terminal Repair Menu, Show / Repair Problems Needing Repair option to begin the repair. If no related problem records are found, go to "MAP 1320: Isolating Problems Using Visual Symptoms" on page 15.
2105 Model 100 UEPO Problem	Description: The UEPO is not working properly. Action: Go to "MAP 2380: Isolating 2105 Model 100 UEPO Problems" on page 26.
2105 Model 100 power on problem.	Description: The power on is not working properly. Action: Go to "MAP 2420: Isolating 2105 Model 100 Power On Problems" on page 29.

MAP 2060: Isolation with All BPS Indicators Off

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Description

This procedure isolates the BPS having no LEDs lit. Either the BPS is faulty or the BPS is not receiving customer power.

Isolation

Do the following one at a time until the problem is corrected.

DANGER

> **Dangerous voltages may be present. Do not touch the internal parts (pins and connectors) of the mainline power cable plugs. (1006)**

1. Ensure that the BPS main CB above the line cord is switched on (|, up).

2. Ensure that the input voltage to the BPS is within 200-480 Vac. This is measured with the voltmeter probes in the test points next to the main CB.

   If the correct voltage is missing, there may be a rack line cord failure.

   DANGER

   > **Customers can be exposed to lethal AC voltages if the mainline power cable retention plate is not installed. Ensure that the mainline power cable retention plate is always installed before returning the machine to the customer. (1009)**

   • Ensure the line cord is fully seated in the BPS.

   • Disconnect the line cord from the customer power source and ensure the correct voltage is available from that source. Replace the line cord or have the customer correct the power problem as needed.

MAP 2350: Isolating BPC (BPS) Good Indicator Blink Codes

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Description

Notes:

1. See "Bulk Power Supply (BPS) Component Locations" on page 174 for the location of the BPC, BPD, BPR, and BPF in the BPS.

2. The 2105 must remain powered off for at least two minutes before it can be powered on.

The BPS, BPC GOOD indicator is normally on if customer line cord power is present. If a fault is found, this indicator will blink. The number of blinks will determine the type of fault. Each set of blinks is separated by a 5 second pause. If more than one fault is found, the blink sequence for each fault type will be repeated. If the rack R2 BPC Good indicator is blinking slowly, the operator panel Line Cord indicator will not be blinking. If the rack R3 BPC Good indicator is blinking slowly, the operator panel Line Cord indicator will be blinking.

Isolation

1. Observe the BPC Good indicators on each BPS in this subsystem. Use the table below to look up all displayed blink codes before beginning the repair. A single problem may cause more than one BPS to display BPC Good indicator blink codes.

MAP 2350: BPC (BPS) Good Indicator Codes

Table 7. BPC Good Indicator Blink Codes

Blink Code	Description and Action
1	Description: BPS, BPC fault (bulk power controller). The BPC section of this BPS has detected a fault. Action: Replace BPC. Use service terminal Repair Menu, Replace a FRU option for the Bulk Power Supply. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.
2	Description: BPS, BPD fault (bulk power distribution). The BPD section of this BPS has detected a fault. Action: Replace BPD. Use service terminal Repair Menu, Replace a FRU option for the Bulk Power Supply. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.
3	Description: Reserved
4	Description: BPS, BPF fault (bulk power fan). The BPS fan control circuits have detected a fan fault. Action: Replace BPS Fan. Use service terminal Repair Menu, Replace a FRU option for the Bulk Power Supply. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.
5	Description: BPS, BPR fault (bulk power regulator). The BPR which creates 350 Vdc has detected a fault. Action: Replace BPR, then 350V Battery, then BPS to 350V Battery Cable. Use service terminal Repair Menu, Replace a FRU options. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.
6	Description: BPS, IBF fault (integrated battery feature). The battery system for this BPS has detected a fault. Action: Ensure the 350 V battery circuit breaker is on (|, up). Ensure the battery to BPS cable is plugged in. Replace the 350 V battery, then BPS, then battery to BPS cable. Use service terminal Repair Menu, Replace a FRU options. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.
7	Description: UEPO condition. The Unit Emergency logic loop has been opened causing the 350 Vdc to be switched off or the UEPO Bypass Switch has been in the bypass position (to right) more than one hour. Action: 1. Ensure the operator panel Unit Emergency switch is in the on (|) position. 2. Ensure the operator panel Local/Remote switch (inside door) is in the down position. 3. Ensure the UEPO Bypass Switch is in the normal position (to left). If the UEPO PWR (power to UEPO loop) indicator is off, replace the BPS. Use service terminal Repair Menu, Replace a FRU options. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18. If the BPS UEPO COMPLT (link complete) indicator is off, set the BPS UEPO bypass switch to bypass (to right). If the BPS UEPO COMPLT indicator does not come on, replace the BPS. Use service terminal Repair Menu, Replace a FRU options. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18. Set the switch back to normal. If the indicator is off, go to "MAP 2380: Isolating 2105 Model 100 UEPO Problems" on page 26.
8	Description: BPS, ACI fault (AC Input). The BPS AC input section is reporting an error condition. Action: Use the Install section procedures to check the customer line cord power and grounding. If no problem is found, replace the BPS. Use service terminal Repair Menu, Replace a FRU option. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.

Table 7. BPC Good Indicator Blink Codes (continued)

Blink Code	Description and Action
9	Description: On battery. This BPS has lost customer input power and is running from the 350 V battery. Action: Have the customer restore power, then press the 2105 Model Exx/Fxx operator panel Local Power switch to switch on the BPS and begin charging the 350 V battery. Go to "MAP 1500: Ending a Service Action" on page 18.
10	Description: Low battery. The 350 V battery connected to this BPS is low. Action: 1. Press the 2105 Model Exx/Fxx Local Power switch momentarily to the on (|) position. 2. If this does not clear this error indication, use the service terminal to show and repair any problem for this 350 V battery. If there is no related problem, then wait up to 24 hours for the 350 V battery to charge and press the 2105 Model Exx/Fxx operator panel Local Power switch again. 3. If the error is still present, replace the 350 V battery, then the BPS and then the battery to BPS cable. Use service terminal Repair Menu, Replace a FRU options. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.
11	Description: Communication failed to the other BPS in this rack. Both BPSs should have this blink code. This indication will automatically reset if communication is restored. Action: The front BPS communicates to the rear BPS through the BPS to BPS cable that plugs into BPC port B. Ensure the cable is properly plugged. Ensure the BPS is powered on (UEPO PWR indicator on). Press the Local Power switch momentarily to the on (|) position. If the error is still present, replace the BPSs one at a time and then replace the cable. Use service terminal Repair Menu, Replace a FRU option for each BPS. The communication cable is replaced without using the service terminal. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18. **Note:** The failing BPS may also have failed to communicate with the BPS in an attached rack which will also have a BPC GOOD blink code. The failing BPS will be the one common to the two BPSs with the blink code.
12	Description: Communication failed from the first 2105 Model 100 (R2) and the second (R3) 2105 Model 100. This will automatically reset when communication is restored. This is only detected by the first 2105 Model 100. Action: Ensure the BPS to BPS cable is plugged into BPD port R2 J7t. Ensure the other end of the cable is plugged into BPC port R3 J9b-A. (See the Installation chapter for further information if needed.) Ensure both BPS are powered on (UEPO PWR indicator on). Press the Local Power switch momentarily to the on (|) position. If the error is still present, replace the BPSs one at a time and then replace the cable. Use service terminal Repair Menu, Replace a FRU option for each BPS. The communication cable is replaced without using the service terminal. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.

MAP 2350: BPC (BPS) Good Indicator Codes

Table 7. BPC Good Indicator Blink Codes (continued)

Blink Code	Description and Action
13	Description: Mismatching BPC/BPD drawer power cable port configuration. The front and rear BPC and BPD ports in this rack must be plugged identically. Each drawer power cable has internal jumpers at the BPS end. The jumpers allow each port to sense if a cable is plugged in. Only the port end of the cable needs to plugged in to be detected. A port that does not detect a cable will not switch on 350V. The front and rear BPS each detect and then build a list of ports that detected cables. The BPSs then share this list with each other. A blink code 13 is displayed by the BPS that did not detect a cable that the other BPS did detect. A blink 13 means a cable is either not plugged in, or has internal jumpers that are defective.

Action: Press the Local Power switch momentarily to the on (|) position and then wait up to two minutes for the error status to be displayed. If the blink code 13 is still present, do the following until the problem is isolated. Ensure the front and rear BPS ports are plugged identically. Correct any misplug and then press the Local Power switch again to ensure the problem has been corrected. If no cable plug problem was found, continue.

Ensure all drawers are already powered on. Use the service terminal to display problems needing repair. A drawer power problem log will be created if the failing cable is plugged into the left or right power supply of a drawer. In addition the drawer power supply, power good indicator will be off. If the power good indicator is off, replace the cable and then the BPS until it is fixed. To test the cable internal jumpers, see the note below. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18. If no problem log is found, and the power good indicator is on, continue.

If the failing cable is plugged into a center drawer power supply, no problem log will be created. This cable is a 'Y' cable that goes to both BPSs. The cable is failing from one BPS and working from the other so the drawer power supply, power good indicator will stay on. The cable is only failing on the section that is between the drawer and the BPS that is blinking the 13 code. Only when both ends of the cable do not have 350V present will the power good indicator go off, and a problem log be created.

Do this procedure to each drawer until the problem is isolated. Ensure the center drawer power supply, power good indicator is on. Trace the drawer center power supply cable down to the BPS that is **not** displaying the blink 13 code. Unplug the drawer power cable from the BPC/BPD port.

If the drawer, power good indicator is now off, replace the cable assembly and then the BPS until it is fixed. To test the cable internal jumpers see the note below. After replacing the FRU, press the Local Power switch momentarily to the on (|) position and then wait one minute for the error status to be displayed. The blink code 13 should be gone.

If the drawer, power good indicator is still on, this drawer power cable and port are not failing. Plug the cable back in to the port and press the Local Power switch momentarily to the on (|) position to ensure the 350V is switched on for this port. Repeat the test for each remaining drawer. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.
Note: A volt/ohm meter can be used to check the continuity of both drawer power cable internal jumpers. Unplug the drawer power cable at all ends (two or three depending on which cable). This removes all power from the cable before you measure continuity. Hold the failing drawer power cable connector that plugs into the PBC/BPD port in your hand facing you with the release tab on the bottom. Ensure the lower left pin location has a blockout pin. Count the pins from the left (1 to 6). The first internal jumper is between the top pin 6 (rightmost pin) and the bottom pin 6 (rightmost pin). The second internal jumper is between the top pin 5 and the bottom pin 5. Both jumpers must have zero resistance, if not replace the cable. If both jumpers have zero resistance, replace the BPS which has a port failure.

Table 7. BPC Good Indicator Blink Codes (continued)

Blink Code	Description and Action
14	Description: Missing battery (IBF) configuration. The front and rear BPR battery ports must both be plugged if the battery feature is installed, or both unplugged if it is not. Each battery to BPS cable has a jumper in it that allows the BPR to sense if a cable is plugged into it. There is a mismatch between the front and rear BPSs. One detects a battery cable plugged and the other does not and is displaying the blink code. Action: Ensure that the battery to BPS cable is plugged into the 350 V battery and BPS J1 connector. The battery circuit breaker should be on (up) although even if it is down, it will not cause this blink code. The Battery Enabled indicator should be on anytime the BPS UEPO Pwr indicator is on, even if the 350 V battery circuit breaker is switched off (O, down). Switch the 350 V battery circuit breaker off (O, down) and then unplug the cable from the 350 V battery J1 connector. Plug the cable back in, you should hear a relay click. If it does not, replace the 350 V battery, BPS and battery to BPS cable one at a time. Use service terminal Repair Menu, Replace a FRU options. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.
15	Description: Missing 2105 Model 100 configuration. There is a mismatch between the front and rear BPSs in R2. One reports a 2105 Model 100, the other does not. The 2105 Model 100 communication cables must be plugged into the same port on the front and rear BPS J7t. (See the service guide install procedures for more information.) Each communication cable has a jumper in it that allows the BPC to sense if a cable is plugged into it. Action: Ensure the cable plugging matches. Press the Local Power switch momentarily to the on (|) position. If the error is still present, replace each BPS and then the communication cable. The communication cable is replaced without using the service terminal. Use service terminal Repair Menu, Replace a FRU options. After the FRU replace is complete, go to "MAP 1500: Ending a Service Action" on page 18.
25	Description: BPC port 7, 2105 Model 100 fault. A 2105 connected to this 2105 is reporting that it detected a power error. Action: Reference the action for blink code 26.
26	Description: BPD port 5, 2105 Model 100 fault. BPD Port 5 is reporting an error from the 2105 Model 100 attached to it. A 2105 Model 100 cable should not be plugged into this port. Action: Reference the service guide installation procedure for installing a 2105 Model 100 to correct the communication cable problem. After correcting the problem, press the 2105 Model Exx/Fxx operator panel Local Power switch momentarily to on to reset the error indication. Then go to "MAP 1500: Ending a Service Action" on page 18.
27	Description: BPD port 6, 2105 Model 100 fault. BPD port 6 is plugged with a 2105 Model 100 communication cable and should not be. Action: Use the service guide install chapter to correctly plug the bulk power supply interconnect cables.
28	Description: BPD port 7, 2105 Model 100 fault. BPD Port 7 is reporting an error from the 2105 Model 100 attached to it. Action: No action for 2105 R2, go to 2105 R3 and look up and repair its blink code.
29	Description: BPD port 8, 2105 Model 100 fault. BPD Port 8 is reporting an error from the 2105 Model 100 attached to it. A 2105 Model 100 cable should not be plugged into this port. Action: Reference action for blink code 26.
30	Description: BPD port 9, 2105 Model 100 fault. BPD Port 9 is reporting an error from the 2105 Model 100 attached to it. A 2105 Model 100 cable should not be plugged into this port. Action: Reference action for blink code 26.

MAP 2350: BPC (BPS) Good Indicator Codes

Table 7. BPC Good Indicator Blink Codes (continued)

Blink Code	Description and Action
31	Description: BPD port 10, 2105 Model 100 fault. BPD Port 10 is reporting an error from the 2105 Model 100 attached to it. A 2105 Model 100 cable should not be plugged into this port. Action: Reference action for blink code 26.
33	Description: BPC port 1 fault. **Note:** The port detected an over-current condition and disabled itself. Action: Press the 2105 Model Exx/Fxx Rack Operator Panel, Local Power switch momentarily to the on (|) position. Wait 1 minute for the error condition to attempt to reset itself. • If the error is no longer present, go to "MAP 1500: Ending a Service Action" on page 18. • If the error is still present, go to "Bulk Power Supply Connection Physical Location Codes" on page 180 to determine the physical drawer this drawer power cable plugs into. • Find the drawer and observe the PWR (power) indicator on the fan-and-power-supply assembly the power cable plugs into. It should be off. Unplug the drawer power cable at the fan-and-power-supply assembly. This will isolate the source of the over-current. • Press the Local Power switch momentarily to the on (|) position. • If the error is no longer present, then replace the fan-and-power-supply assembly FRU. Go to MAP 3150 in chapter 3 of the 2105 Model Exx/Fxx service guide. • If the error is still present, replace the drawer power cable. • Press the Local Power switch momentarily to the on (|) position. • If the error is no longer present, go to "MAP 1500: Ending a Service Action" on page 18. • If the error is still present, replace the BPS (bulk power supply). Use the service terminal Repair Menu, Replace a FRU option. Then return here and continue. • Press the Local Power switch momentarily to the on (|) position. • If the error is no longer present, go to "MAP 1500: Ending a Service Action" on page 18. • If the error is still present, call the next level of support.
34	Description: BPC port 2 fault. See Note: and Action: for code 33
35	Description: BPC port 3 fault. See Note: and Action: for code 33
36	Description: BPC port 4 fault. See Note: and Action: for code 33
37	Description: BPC port 5 fault. See Note: and Action: for code 33
38	Description: BPC port 6 fault. See Note: and Action: for code 33
39	Description: BPC port 7 fault. See Note: and Action: for code 33
40	Description: BPD port 1 fault. See Note: and Action: for code 33
41	Description: BPD port 2 fault. See Note: and Action: for code 33
42	Description: BPD port 3 fault. See Note: and Action: for code 33
43	Description: BPD port 4 fault. See Note: and Action: for code 33
44	Description: BPD port 5 fault. See Note: and Action: for code 33
45	Description: BPD port 6 fault. See Note: and Action: for code 33
46	Description: BPD port 7 fault. See Note: and Action: for code 33
47	Description: BPD port 8 fault. See Note: and Action: for code 33
48	Description: BPD port 9 fault. See Note: and Action: for code 33
49	Description: BPD port 10 fault. See Note: and Action: for code 33

MAP 2380: Isolating 2105 Model 100 UEPO Problems

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Description

Notes:

1. See "Bulk Power Supply (BPS) Component Locations" on page 174 for the location of the BPA and BPC in the BPS.
2. The 2105 must remain powered off for at least two minutes before it can be powered on.

The UEPO (Unit Emergency Power Off) is used to switch off the BPS 350 Vdc. When off, the BPS still has low voltage DC to operate the UEPO logic circuits. To remove the low voltage DC from the BPS, set the input circuit breaker on the BPS to off.

The 2105 Model 100 UEPO is controlled only from the 2105 Model 100 operator panel Unit Emergency switch. If the 2105 Model 100 Unit Emergency switch is switched off, only the 2105 Model 100 350 Vdc will power off immediately. The BPC, UEPO PWR indicator will be on and the UEPO CMPLT indicator will be off. Any attached 2105 Model Exx/Fxx or 2105 Model 100 will stay powered on.

The 2105 Model 100 operator panel Line Cord indicators will be:

- off when there is no customer line cord power. All the BPS indicators will be off.
- Off when there is customer line cord power, there is no UEPO condition and the 2105 Model 100 is powered off. The BPC, UEPO PWR indicator will be on.
- Repeatedly slow blink 7 times with a pause of 5 seconds to indicate the BPS has detected an UEPO condition. This occurs 2 minutes after the UEPO condition occurs.
- On steady (not blinking) when the 2105 Model 100 is powered up normally.

Each BPS has a UEPO signal loop to control the 350 Vdc output. When the loop is complete, the 2105 Model Exx/Fxx operator panel Local Power switch can power on the 2105 Model 100 the 350 Vdc.

There are two BPS indicators that are used to determine the condition of the UEPO signal loop. The UEPO PWR indicator is on when there is signal to the UEPO loop. This signal should be present when customer power is supplied to the BPS and the BPS input circuit breaker is in the on position (|, up). The UEPO CMPLT indicator is on when the UEPO loop circuit is complete and the UEPO PWR indicator is also on.

The UEPO loop is made complete in two ways. The BPS UEPO bypass switch in the bypass position (to the right) completes the loop internally. This bypasses the UEPO signal through the external loop. When the UEPO bypass switch is in the NORMAL position (to the left), the external loop is as follows:

- Leaves the BPS on the BPC J8 connector
- Passes through the bulk power interconnect cable for the 2105 Model 100 connected to the 2105 Model Exx/Fxx
- Through the BPS to operator panel UEPO cable for the 2105 Model 100 connected to the first 2105 Model 100
- Into the 2105 Model 100 operator panel
- To the operator Unit Emergency switch
  - On (|, up) completes the loop
  - Off (O, down) opens the loop
- To the operator Local / Remote switch

MAP 2380: 2105 Model 100 UEPO

      – On (|, up) completes the loop

      – Off (O, down) opens the loop

Isolation

The 2105 Model Exx/Fxx and 2105 Model 100 are needed stand-alone for this isolation. Ensure that the customer is not using it. This isolation does a complete checkout of the UEPO functions.

1. Power off the 2105 Model Exx/Fxx and 2105 Model 100 by pressing the 2105 Model Exx/Fxx operator panel local power switch momentarily to off (O, down). After they are powered off:

   - Ensure that the 2105 Model 100 BPC, UEPO bypass switch on both BPS (front and rear) is set to NORMAL (left).

   - Ensure that the 2105 Model 100 operator panel Unit Emergency switch is in the on (|, up) position.

   - Ensure that the 2105 Model Exx/Fxx operator panel Unit Emergency switch is in the on (|, up) position.

   - Ensure that the 2105 Model 100 operator panel Local/Remote switch, inside the front door, is in the down position.

2. Check if the BPS, UEPO PWR indicator is off on either BPS.

   - If the indicators are on, continue with the next step.

   - If the indicator is off, the customer line cord power is off, the BPS input circuit breaker is off or the BPS is failing and needs to be replaced. Correct the condition and return to step 1 in this MAP.

3. Check if the UEPO CMPLT indicator on each BPS is on.

   - If the indicators are on, continue with the next step.

   - If an indicator is off, set the BPS UEPO Bypass switch to the BYPASS position (to the right).

     – If the UEPO CMPLT indicator remains off, replace the BPS. Then and return to step 1 in this MAP.

     – If the UEPO CMPLT indicator comes on, the UEPO loop inside the BPS is working. The external UEPO loop is open. Read the last paragraph in the Description section of this MAP for details of the loop. Ensure the cables are properly plugged. If the loop is still open, replace the FRUs in the loop until the problem is corrected and return to step 1 in this MAP.

     If both BPSs have the same open loop indication, the only FRU they share is the 2105 Model 100 operator panel.

4. Set the operator panel Unit Emergency switch to the off (O, down) position. The BPC, UEPO CMPLT indicator should go off.

   - If the UEPO CMPLT indicator does not go off, unplug the BPS to Operator Panel cable at the BPS J8 connector.

     – If the indicator stays on, replace the BPS then return to step 1 in this MAP.

     – If the indicator goes off, the UEPO loop is not being opened by the operator panel Unit Emergency switch. Plug the cable into J8. Replace the operator panel. After correcting the problem, return to step 1 in this MAP.

   - If the UEPO CMPLT indicator goes off, the UEPO is working fine. Set the operator panel Unit Emergency switch to the up the on (|, up) position. Return to the procedure that sent you here or go to "MAP 1500: Ending a Service Action" on page 18.

MAP 2420: Isolating 2105 Model 100 Power On Problems

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Description

The 2105 Model Exx/Fxx is not powering on correctly. This procedure requires the entire 2105 Model 100 subsystem be taken away from customer use before continuing.

Note: The 2105 Model 100 must remain powered off for at least two minutes before it can be powered on.

Isolation

1. Ensure that the 2105 Model Exx/Fxx or 2105 Model 100 that this 2105 Model 100 is attached to powers on correctly. Fix any problem with that frame before continuing at the next step.

2. Ensure that the bulk power interconnect cables between the 2105 Model Exx/Fxx and the first 2105 Model 100 are connected properly. Each of the two cables has three connectors. If a second 2105 Model 100 is attached, ensure that the bulk power interconnect cables are correctly connected to the first 2105 Model 100. Refer to Install and Remove chapter 5 for details on the connections.

3. Attempt to power on the 2105 Model 100 again. Momentarily press the 2105 Model Exx/Fx operator panel local power switch to the on position. If the 2105 Model 100 fails to power on, continue with the next step.

4. Go to "MAP 2380: Isolating 2105 Model 100 UEPO Problems" on page 26 to verify the 2105 Model 100 Unit Emergency (UEPO) operation.
   - If the UEPO check finds and repairs a problem, the power on problem should be resolved.
   - If no 2105 Model 100 UEPO problems are found, return here and continue with the next step.

5. Observe the 2105 Model 100 BPS, BPC Good indicators.

   Note: See "Bulk Power Supply (BPS) Component Locations" on page 174 for the location of the BPC in the BPS.
   - If a BPC Good indicator is off, go to "MAP 2000: Entry for Visual Power Symptoms" on page 19.
   - If a BPC Good indicator is blinking, go to "MAP 2350: Isolating BPC (BPS) Good Indicator Blink Codes" on page 21.
   - If the BPC Good indicators are on solid, continue with the next step.

   Note: The BPS, BPC indicators will blink a code when any error conditions are detected. Keep checking these indicators as you continue with this MAP. If it begins to blink, go to "MAP 2350: Isolating BPC (BPS) Good Indicator Blink Codes" on page 21 to repair the problem.

6. Check the 2105 Model 100 BPS, BPC Ready indicators. Are they blinking?
   - **Yes** go to "MAP 2350: Isolating BPC (BPS) Good Indicator Blink Codes" on page 21 to repair the problem.
   - **No**, they are on solid. The 2105 Model 100 powered on properly. Go to "MAP 1500: Ending a Service Action" on page 18.

MAPs 3XXX SSA DASD Drawer Isolation Procedures

DASD 3XXX MAPs to repair this rack are available in the service guide for the 2105 Model Exx/Fxx that the 2105 Model 100 racks attach to.

MAPs 4XXX: Cluster Isolation Procedures

Procedures in the MAP 4XXX group of the Isolate chapter are also available in the service guide for the 2105 Model Exx/Fxx that the 2105 Model 100 racks attach to.

MAP 4710: Isolating a DDM LIC Update Problem

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Description
A failure was detected when new disk drive module (DDM) licensed internal code was being downloaded to the DDMs during a cluster power on and code load.

Note: The term download means the same as update.

One of the following error conditions could have been detected:
- SSA card is not in the proper state.
- Unable to check the array status.
- Arrays are not in the proper state.
- DDM diagnostic failed for pdiskXX.
- Download failed for pdiskXX.
- The download process took too long and timed out.

The DDM code download process includes the following:
- The new DDM code is included on the 2105 LIC Code update CD-ROM.
- The DDM code is copied onto each cluster as part of the update process for the cluster. A DDM Download Required status is set in the cluster code. This flag starts the DDM download process the next time the cluster is rebooted or powered on.
- The LIC update process copies the code from the CD-ROM and reboots the clusters.
- The cluster boot process checks the DDM code load flag. If it is set on, each cluster begins the DDM code download process to all the drawers cabled and installed to it.
- The cluster operator panel will display a 10 character progress code, SL111-00XX when the download process is occurring. The XX is the time in minutes that the process has been running. All the arrays (customer data included) are unavailable until the download process has completed. When the process has completed, the cluster boot process will also complete and READY will be displayed.
- The cluster DDM download process is run to one DDM at a time. It runs the DDM diagnostics, then loads the new code, then runs the DDM diagnostics again. If the diagnostics and code load are successful, thee process is repeated on the next DDM, until every DDM is complete. Each DDM may take approximately 40 seconds. A maximum configuration may take 30 to 50 minutes.

- A 99 minute timer begins at the start of the DDM download process. This is the value displayed as SL111-00XX. If the DDM download process is not complete after 99 minutes, the cluster operator panel will be left displaying, SL111-0F00.

- If a DDM diagnostic or DDM code update fails, a problem log is created and the cluster operator panel will be left displaying, SL111-0E00. The DDM that failed will also be recorded in the DDM code update status. The remaining DDMs will not have been downloaded yet.

- After the DDM is repaired, the DDM download process needs to be started again. The service terminal DDM Download Restart option will cause a cluster shutdown and reboot. The cluster will start with the first DDM and check each one until it finds the DDM that was repaired. If the diagnostics and download are successful this time, the process will continue to download the remaining DDMs, one at a time.

The service terminal disk drive module (DDM) LIC Menu options are used to continue or cancel a DDM download process that stopped with an error.

- DDM Download Status option

  Displays if the DDM download is complete and successful, or errors occurred.

- DDM Download Restart option

  Restarts the download process if a prior download process did not complete updating all the DDMs, because of an error.

- DDM Download Force Reset option

  Note: This is only used when directed by the next level of support and with customer permission. This option is a nonconcurrent action. It will force a shutdown and reboot of both clusters.

  A prior code download process did not complete updating all the DDMs because of an error. Instead of repairing the error and restarting the download, this option is being selected. This option leaves all the DDMs at their current microcode level even though the DDMs may be at different code levels. It resets the DDM Download Required status. This ensures that a cluster reboot or power on will not attempt the DDM download process.

Isolation

1. Read the description section above.

2. Use the service terminal to display problems needing repair. Look for related problem (SSA or drawer FRUs).

   From the service terminal **Main Service Menu**, select:
   > **Repair Menu**
   > > **Show / Repair Problems Needing Repair**

   – If there are no related problems, call the next level of support.

   – If there are related problems, fix them and then return here and continue with the next step.

3. Use the DDM Download Restart option described above to complete the DDM download process.

   From the service terminal **Main Service Menu**, select:
   > **Licensed Internal Code Maintenance Menu**
   > > **Disk Drive Module (DDM) LIC Menu**
   > > > **DDM Download Restart**

MAP 4740: Isolating an Invalid Battery Status

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Description

A front or rear bulk power supply went *on battery*, this is normally caused by a loss of customer mainline AC power. As the mainline AC loss/battery enabled was being logged, it was discovered that the battery group feature had not been logically installed with the service terminal. The 2105 Model 100 and any attached 2105 Model 100s must all have the 350 V battery feature installed.

Isolation

1. Observe the problem log and write down the Resource Location for the battery group that is not logically installed.

   Note: Each 2105 Model 100 attached to the 2105 Model Exx/Fxx must have the battery group feature physically and logically installed.

2. Ensure that all 2105 Model 100s in the subsystem, have the battery group feature physically installed.
   - If the Resource Location listed does not have a battery group feature physically installed, this is a false error. Replace the Bulk Power Supply.
   - If the battery group feature is physically installed, continue with the next step.

3. Display the logically installed battery Resources Locations. Verify that the Resources Location displayed matches that listed in the problem log.

   From the service terminal **Main Service Menu**, select:
   > **Install/Remove Menu**
   >> **350V Battery Group Menu**
   >>> **List Installed 350V Battery Groups**

4. Logically install the battery group feature.

   From the service terminal **Main Service Menu**, select:
   > **Install/Remove Menu**
   >> **350V Battery Group Menu**
   >>> **Install 350V Battery Groups**

5. Go to "MAP 1500: Ending a Service Action" on page 18.

Chapter 4. FRU Removal and Replacement Procedures

Overview of Repair Chapter

This chapter describes FRU removal and replacement procedures and ESD
procedures.

Refer to "Working with ESD-Sensitive Parts" on page 34 before you work with any
logic cards, logic board, or cables connected to FRUs that are sensitive to
electrostatic discharge (ESD).

Because these instructions describe 2105 Model B09 and 2105 Model 100 racks and SSA DASD Model 020 drawers, some diagrams might not specifically show the rack or drawer you are repairing.

FRU Removal and Replacement Procedures

Select the field replaceable unit (FRU) you want to repair from "Chapter 4. FRU Removal and Replacement Procedures" on page 33 and go to the page shown. If you were not sent here from the service terminal, go to "Chapter 2. Entry MAP for All Service Actions" on page 13 to replace a FRU.

Using the Repair Chapter

This chapter describes how to remove and replace field-replaceable units (FRUs) from SSA DASD drawers and 2105 units.

Each FRU has its own removal and replacement procedure, for example, SSA DASD Drawer Power On and Off Procedure, Model 020 Drawer. When a step in a procedure refers to another procedure, a reference to that procedure is given. For example:

1. Locate the SSA DASD drawer and the disk drive module you will be removing (see "SSA DASD Drawer and Disk Drive Module Locations, Model 020/040 Drawer" on page 36).

The references show you where to find more information, if you need it. Always return to the original procedure after referring to the information.

Standard Tools Needed

The following is a list of standard tools needed to service the IBM 2105 Versatile Storage Server.
• Number 2 Supadriv screwdriver (P/N 4760542)
• Number 2 Supadriv bit (P/N 9900767)
• Screwdriver, ratchet magnetic tip (P/N 56X2974)
• Torx kit (P/N 39F8407)
• 8-mm socket wrench, 1/4-inch drive (in the basic tool kit)
• 7-mm socket wrench, 1/4-inch drive (P/N 179239, included in metric B/M 1749235 in the basic tool kit)
• ESD handling kit (P/N 93F2649)
• ESD wrist band (P/N 6425959)
• SSA tool, screwdriver (P/N 32H7059)

Note: For a list of special tools needed, refer to "Special Tools" on page 11.

Working with ESD-Sensitive Parts

Attention: Always wear an electrostatic discharge (ESD) wrist strap properly connected to the ESD ground bracket when you service this machine. This prevents possible damage to the 2105 rack and SSA DASD drawer and decreases any possible impact to customer operations.

Following is a list of the ESD-sensitive parts in the IBM 2105 Versatile Storage Server. Always wear the ESD wrist strap when you work on or touch any of these parts.
• All logic cards

- All logic boards
- All drawer FRUs
- Any cables connected to ESD-sensitive parts

How to Attach the ESD Wrist Strap

Before you touch any ESD-sensitive part, place the ESD wrist strap on either wrist. This strap has a high resistance (>1 megohm) resistor in series with the grounding clip so there is no danger to you. It discharges the static electricity from your body.

Connect the clip on the flexible grounding cord to an unpainted frame ground point on the 2105 rack. Keep the strap on and connected while you touch, insert, or remove any ESD-sensitive part.

Attention: When you wear the ESD wrist strap, ensure the flexible grounding cord remains connected to you and to the frame of the machine.

ESD Precautions

To prevent damage when you work with ESD-sensitive parts, perform these instructions carefully.

- Keep the ESD-sensitive part in a special ESD bag until you are ready to install the part into the machine.
- Make the fewest possible movements with your body to prevent an increase of static electricity from clothing, fibers, carpets, and furniture.
- If instructed to do so, switch off the machine power before you remove ESD-sensitive parts.
- Just before touching the ESD-sensitive part, discharge to the machine any static electricity in your body by touching the metal frame or cover of the machine. If possible, keep one hand on the frame when you install or remove an ESD-sensitive part.
- Never touch or work on any electronic circuits without wearing the ESD wrist strap.

  Touching the logic board pins without wearing the ESD wrist strap (for example, while counting the pins) can cause logic card failures. Touching the voltmeter leads when you measure board pins or cable connections can also cause ESD damage.
- Do not place any ESD-sensitive parts on the machine cover or on a metal table because large metal objects can become discharge paths if they are not grounded. If you must set aside an ESD-sensitive part, first place it into the special ESD bag.
- Prevent ESD-sensitive parts from being accidentally touched by other personnel such as service representatives or customers. Reinstall all covers when you are not working on the machine.
- If possible, keep all ESD-sensitive parts in a grounded metal case.
- Be very careful when you work with ESD-sensitive parts in cold weather. Low humidity and heating increase static electricity.

Replacing a FRU Using the Service Terminal

Use the following service terminal procedure to select and replace a FRU not listed in a repair procedure.

Replacing a FRU Using the Service Terminal

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of other guided procedures. Failure to follow this attention can cause customer operations to be disrupted.

1. Select **Repair Menu** from the Main Service Menu.
2. Select **Replace a FRU** from the Repair Menu
3. Move the cursor to the desired FRU Category and press Enter on the Select a FRU Category menu.
4. Move the cursor to the FRU being replaced and press Enter on the Select a FRU to Replace menu.
5. Follow the instructions displayed on the service terminal to complete the repair process.

SSA DASD Drawer and Disk Drive Module Locations, Model 020/040 Drawer

Use the following information to locate a logical SSA DASD drawer and disk drive module in a 2105 Model 100 rack.

This procedure is for Model 020/040 Drawer drawers.

- For logical drawer locations in a 2105 Model 100 rack, see "SSA DASD Drawer Physical Location Codes" on page 183.
- For disk drive module locations in a SSA DASD drawer, see "Disk Drive Module Locations in a SSA DASD Drawer".

Disk Drive Module Locations in a SSA DASD Drawer
Use Figure 8 to determine the position of the disk drive modules in a Model 020 drawer shown.
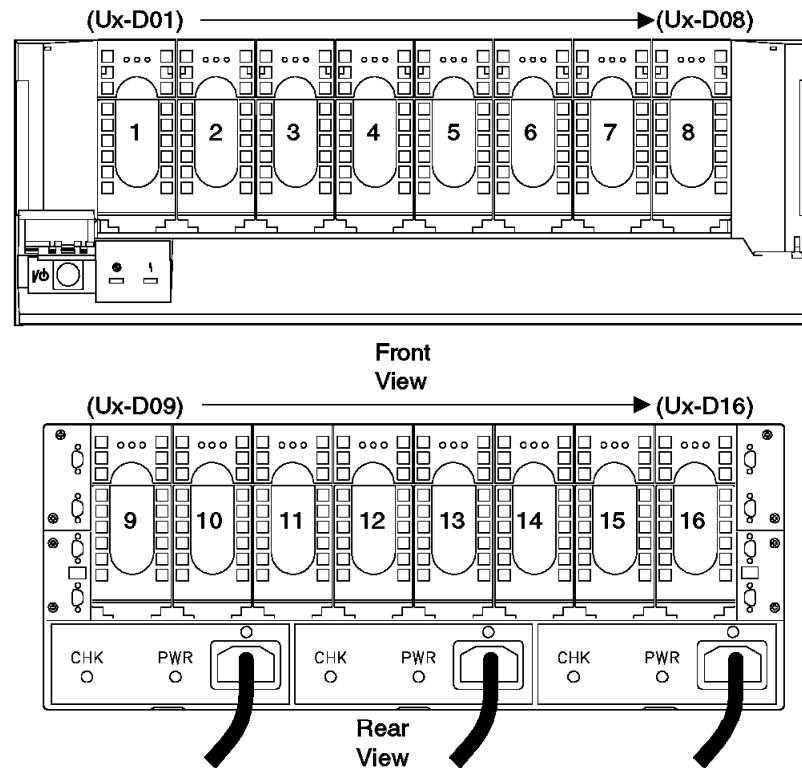
Figure 8. Disk Drive Module Locations in a SSA DASD Drawer (t007043m)

SSA DASD Drawer Power On and Off Procedure, Model 020 Drawer

This procedure is for SSA DASD Model 020 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Power Off, Model 020 Drawer

Note: Unless you have a particular reason, *do not power off the 2105 Model 100 or SSA DASD drawer unless the instructions that you are following tell you to.*

1. Ensure that the disk drive modules in the SSA DASD drawer you will be powering off are no longer available to the using system.
2. Open the front cover of the 2105 Model 100 rack and locate the SSA DASD drawer you will be powering off, see "SSA DASD Drawer Physical Location Codes" on page 183.
3. Open the flap that covers the Power switch, the flap pivots to the right.
4. Power the SSA DASD drawer off, press and release the Power switch **1**.
5. Wait for the SSA DASD drawer Subsystem Power indicator **2** to go off.

Drawer Power
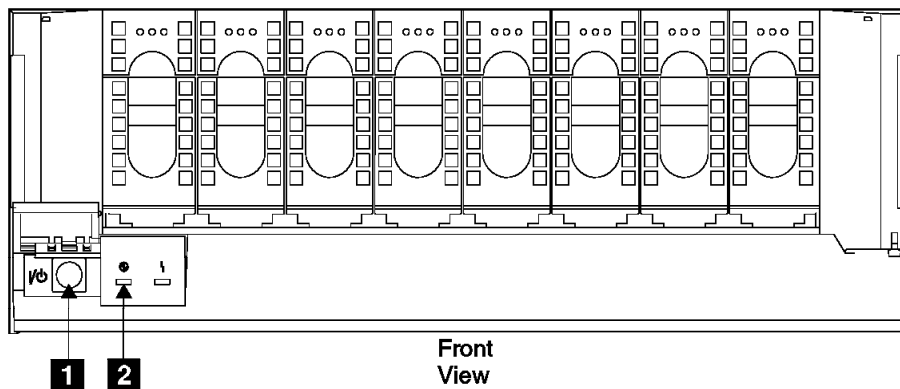
Figure 9. Drawer Power Control (t007051l)

6. Do this step to remove all power from the SSA DASD drawer.

    Open the rear cover of the 2105 and disconnect all three power cables **3** from the rear of the drawer.
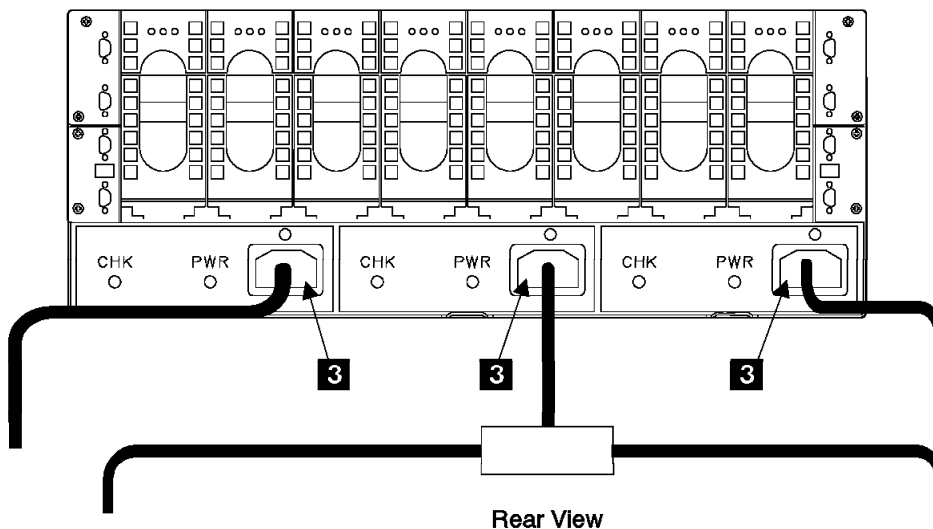
*Figure 10. SSA DASD Drawer Rear Power Connectors (t007241m)*

7. Return to the procedure that sent you here.

Power On, Model 020 Drawer

1. Open the front cover of the 2105 and locate the SSA DASD Drawer you will be powering on, see "SSA DASD Drawer Physical Location Codes" on page 183.

2. Open the rear cover of the 2105 and reconnect the three drawer power cables **1** if they were disconnected earlier.
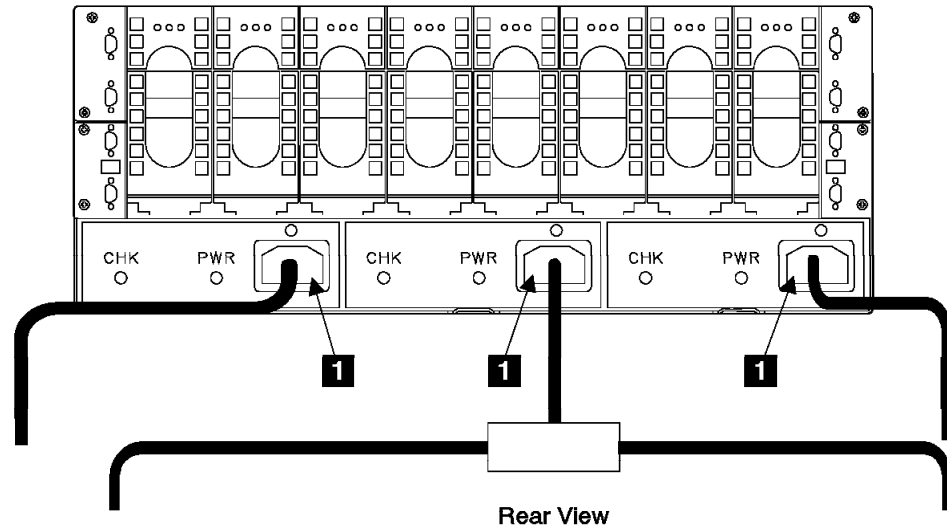
Figure 11. SSA DASD Drawer Rear Power Connectors (t007246m)

3. Go to the front of the SSA DASD drawer and open the flap that covers the Power switch, the flap pivots to the right.
4. Power the SSA DASD drawer on, press and release the Power switch **2** .
5. Wait for the SSA DASD drawer Subsystem Power indicator **3** to go on.
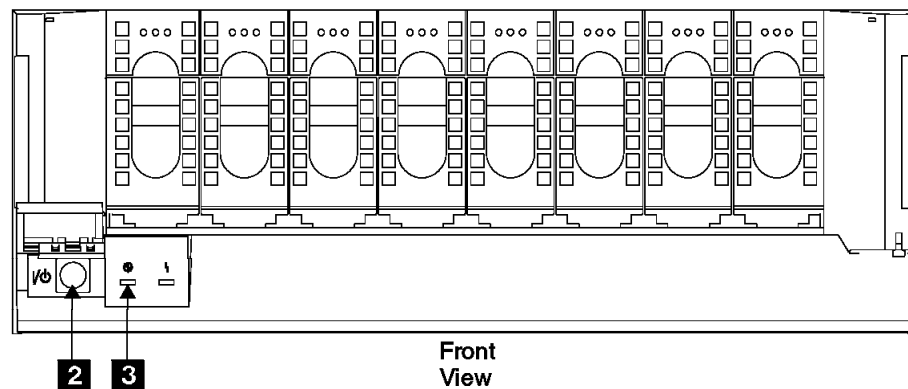
Figure 12. Drawer Power Control (t007247l)

6. Return to the procedure that sent you here.

Drawer SSA Disk Drive Module Removal and Replacement, Model 020/040 Drawer

This procedure is for SSA DASD Model 020 and 040 drawers.

A disk drive module (DDM) is one FRU. Always replace it as a complete FRU.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Drawer SSA Disk Drive Module

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Removing a Disk Drive Module
Attention:

- Disk drive modules are fragile. Handle them with care, and keep them well away from strong magnetic fields.
- All slots *must* contain DDMs. No dummy DDMs or empty slots are allowed.

Notes:

1. Unless you have a particular reason, *do not power off the 2105 or SSA DASD drawer when removing disk drive modules*.
2. If you are removing several DDMs as part of a drawer or backplane removal, carefully mark the locations of all modules before removing them. This ensures that you will reinstall the modules into their original slots. Attach identifying labels to the modules if you want to.

1. Locate the SSA DASD drawer with the disk drive module you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.
2. Open the front or rear cover of the 2105 Model 100 rack you are working on.
   - SSA disk drive module number 1 to 8 (DRAWERdd-D01 to DRAWERdd-D08):
     a. Open the front cover of the 2105.
   - SSA disk drive module number 9 to 16 (DRAWERdd-D09 to DRAWERdd-D16), open the rear cover of the 2105.
3. Find the disk drive module you are replacing see "Disk Drive Module Locations in a SSA DASD Drawer" on page 36.

   Note: The amber Check indicator on the disk drive module you are replacing should be on:
   - Model 020 Drawer, **1**
   - Model 040 Drawer, **2**

   With some failures, the Check indicator **1** or **2** will not turn on. If this is the case, verify again that you are working on the correct drive module, then continue with the next step.

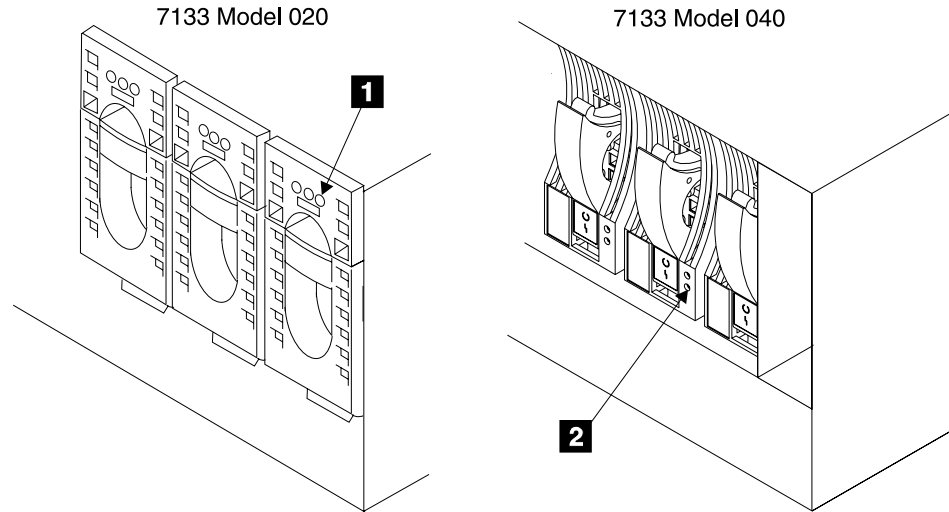7133 Model 020   7133 Model 040

Figure 13. Disk Drive Module Check Indicator (s007707m)

4. Open the DDM handle:

- Model 020 Drawer, press upward behind the red panel **3** , and pull the
  handle down **4** . This action pulls the disk drive module partly out of its slot.
- Model 040 Drawer, press the blue latch **5** , and pull the handle down **6** .
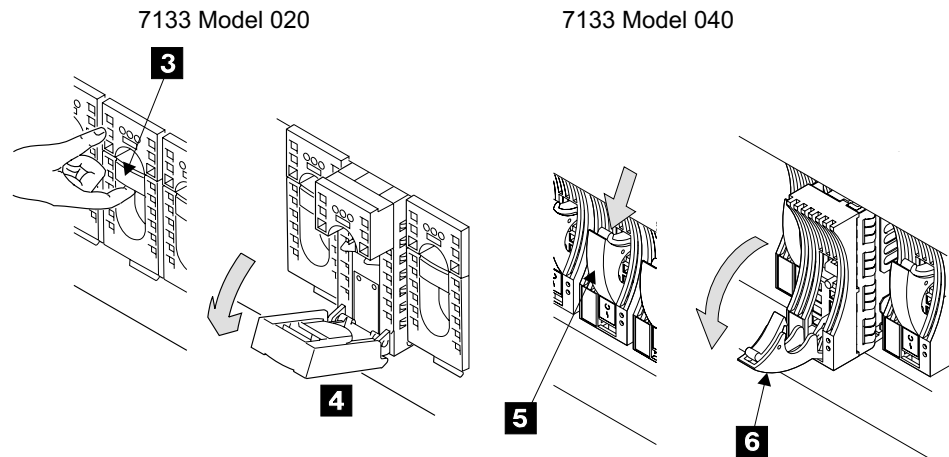 This action pulls the disk drive module partly out of its slot.

7133 Model 020   7133 Model 040

Figure 14. Drive Removal (t009085)

5. Grip the handle, and carefully pull the disk drive module out of the drawer. As
   the drive comes out, put one hand under it to prevent it from falling.

Drawer SSA Disk Drive Module

7133 Model 020   7133 Model 040
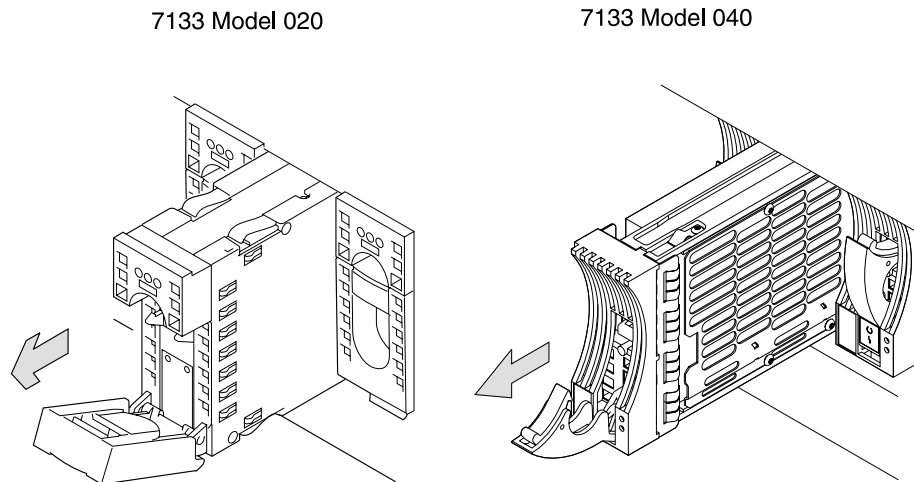
Figure 15. Disk Drive Removal (s007710m)

6. 7133 Model 040 DDMs only, lay the DDMs down so they rest on their supports **7** .
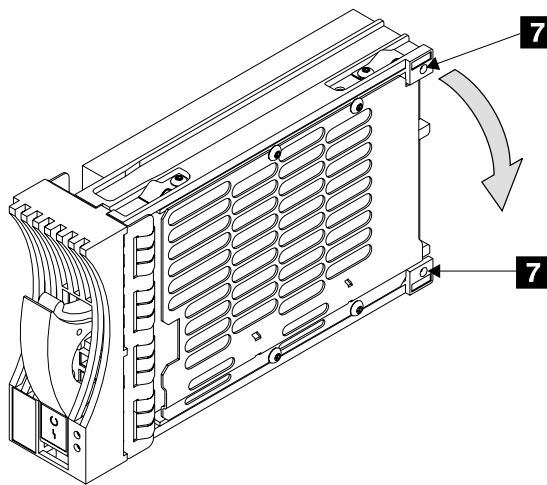
Figure 16. SSA DASD Model 040, Placing a DDM in a Safe Position (t009086)

7. Install a new disk drive module into the empty slot, go to "Replacing a Disk Drive Module"

Replacing a Disk Drive Module

1. Remove the factory-sealed wrapping from the new disk drive module only when you are ready to install it.
2. Open the DDM handle before installation:
   - Model 020 Drawer, press upward behind the red panel **1** , and pull the handle down **2** .
   - Model 040 Drawer, press the blue latch **3** , and pull the handle down **4**

7133 Models 010 and 020   7133 Model 040
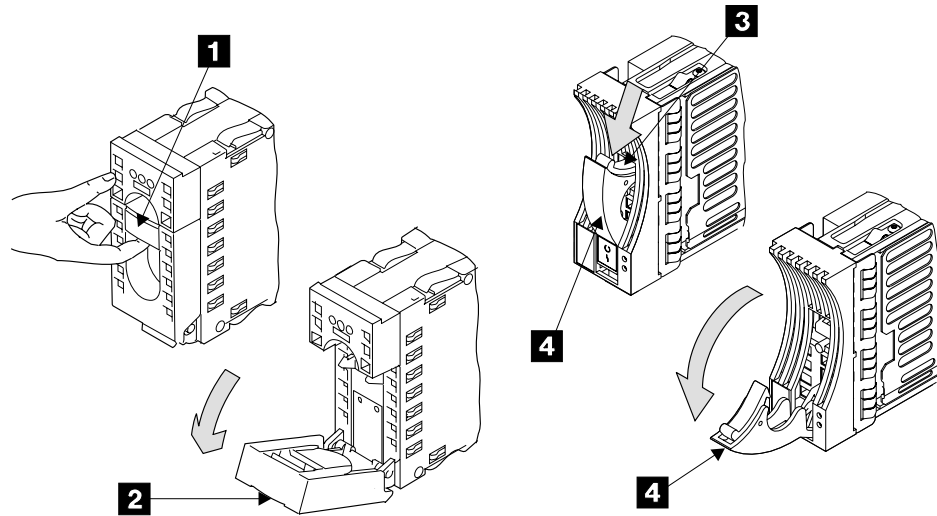
Figure 17. Disk Drive Module Replacement s007711m)

3. With one hand under the drive, align the drive with the groove, and push it into its slot:

    *   Model 020 Drawer, **5**
    *   Model 040 Drawer, **6**

    The drive stops before it is fully seated.

7133 Model 020   7133 Model 040
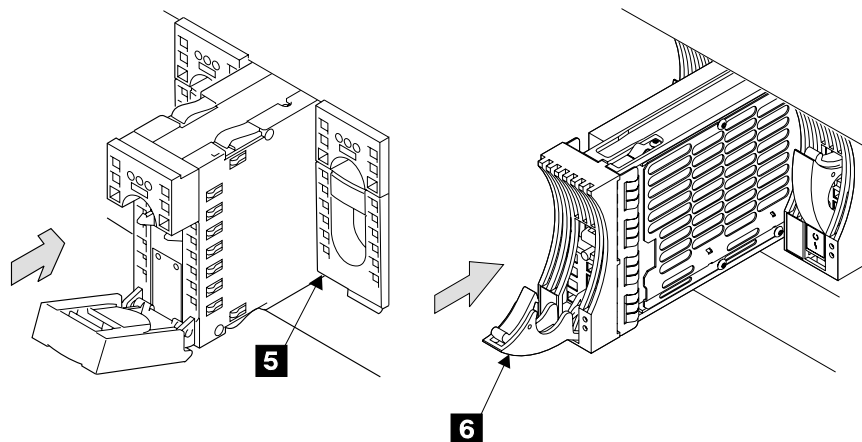
Figure 18. Drive Module Installation (s007712m)

4. Push the disk drive modules handle up until it latches closed:

    *   Model 020 Drawer, **7**
    *   Model 040 Drawer, **8**

Drawer SSA Disk Drive Module
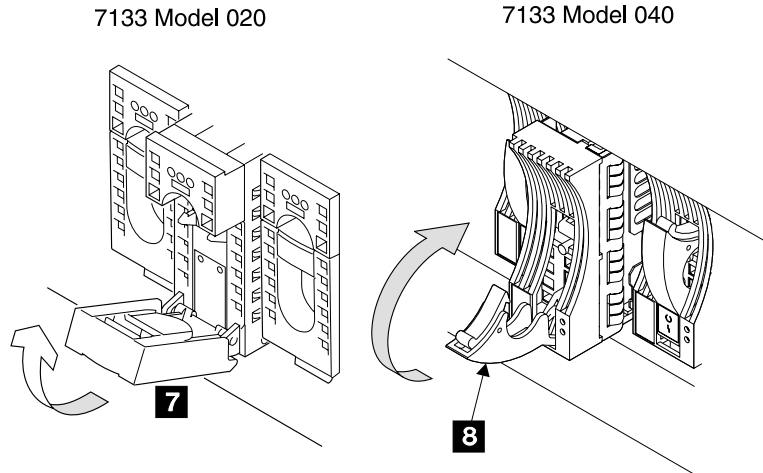
Figure 19. Drive Lock Installation (s007713m)

5. Verify that the front of the new drive module is aligned with the other drives.
6. When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.

Drawer Fan-and-Power-Supply Assembly Removal and Replacement, Model 020 Drawer

This procedure is for SSA DASD Model 020 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Attention: If you are replacing the fan-and-power-supply assembly concurrently, with power on, insure that you have only one fan-and-power-supply assembly removed from the SSA DASD drawer at a time.

Note: Unless you have a particular reason, *do not power off the 2105 Model 100 or SSA DASD drawer when removing a fan-and-power-supply assembly*.

1. Open the rear cover of the 2105 Model 100 rack and locate the SSA DASD drawer with the fan-and-power-supply assembly you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.
   - Fan-and-power-supply assembly 1 (DRAWERdd-V1) **1**
   - Fan-and-power-supply assembly 2 (DRAWERdd-V2) **2**
   - Fan-and-power-supply assembly 3 (DRAWERdd-V3) **3**

   The CHK (check) indicator on the fan-and-power-supply assembly you are replacing should be on.

   If the CHK (check) indicator is not on, verify that you are working on the correct rack, drawer, and fan power supply assembly.

Note: With some failures, the amber CHK (check) indicator will not turn on. If this is the case, verify again that you are working on the correct fan-and-power-supply assembly then continue with the next step.
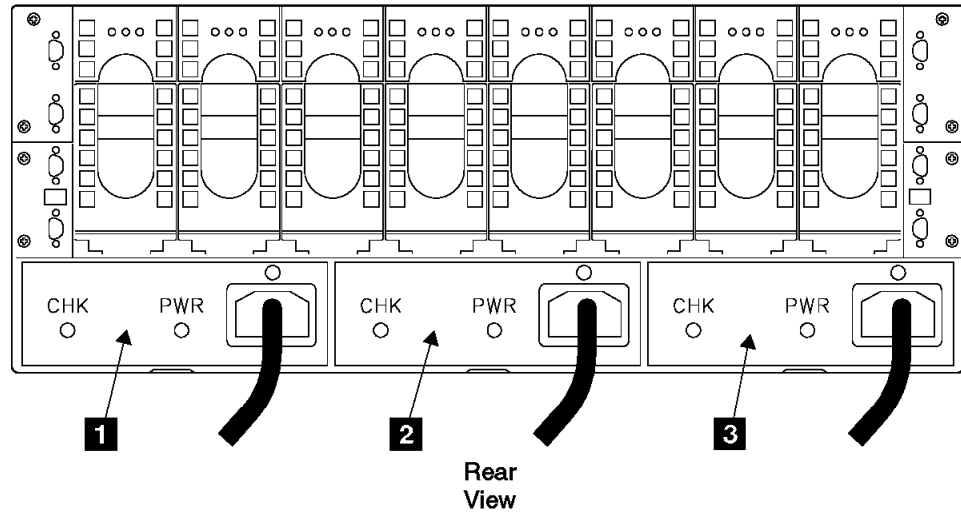

Figure 20. Fan and Power Supply Power Locations (t007068m)

2. At the rear of the SSA DASD drawer, unplug the power cable J15 **5** from the fan-and-power-supply assembly that you are removing (fan-and-power-supply 1 shown).

3. Open the latch **4** on the fan-and-power-supply assembly you are removing, and pull the assembly out of the SSA DASD drawer.

   DANGER

   Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit. (1008)

Fan-and-Power-Supply Assembly
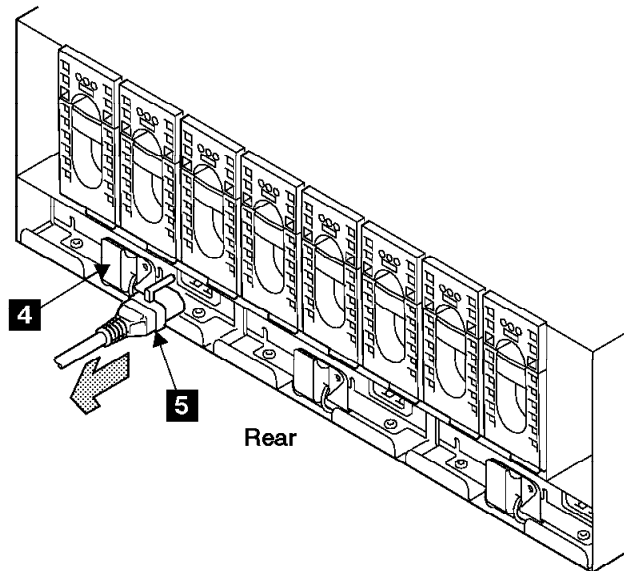
Figure 21. Fan-and-Power-Supply Power Latch and Power Connector (t007064m)

4. Replace parts in the reverse order, then continue with step 5.

5. Observe the PWR (power) indicator on the fan-and-power-supply assembly you just installed.

   Is the PWR (power) indicator on?

   - **Yes**, go to step 8 on page 47.
   - **No**, go to step 6.

Rear View
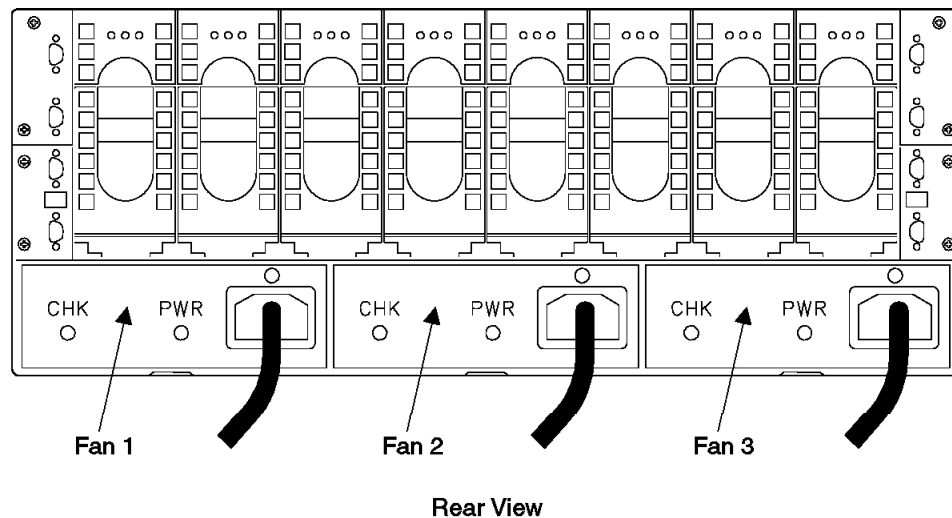
Figure 22. Fan-and-Power-Supply Assembly Indicators (t007382m)

6. Power from the BPS to the fan-and-power-supply assembly may have automatically switched off in the BPS.

   a. Go to the operator panel on the front of the 2105 Model Exx/Fxx that this rack is attached to.

   b. Press the 2105 Model Exx/FxxLocal Power switch to On (|, up) **6** then release it.

    c. Return to the fan-and-power-supply assembly. Wait 15 seconds then observe the PWR (power) indicator again.

Is the PWR (power) indicator on?

- **Yes**, go to step 8.
- **No**, go to step Figure 14 on page 41.
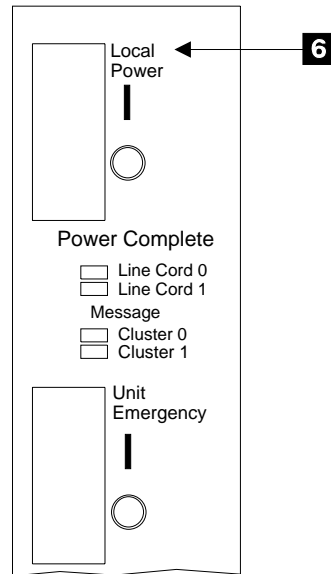
Figure 23. 2105 Model Exx/Fxx Operator Panel Locations (t007520m)

7. The PWR (power) indicator is off because of a failing bulk power supply or fan-and-power-supply assembly. Do one or both of the following:
   - Find the bulk power supply fault using "MAP 2000: Entry for Visual Power Symptoms" on page 19.
   - The new fan-and-power-supply assembly may be defective, replace it again.
8. Return to the procedure that sent you here.

Drawer Power Control Panel Removal and Replacement, Model 020 Drawer

This procedure is for SSA DASD Model 020 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not power off the 2105 or SSA DASD drawer when removing power control panel assemblies*.

1. Open the front cover of the 2105 Model 100 rack and locate the SSA DASD drawer with the drawer power control panel you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.
   - Drawer power control panel (DRAWERdd-L3) **1**

Drawer Power Control Panel

2. Unscrew the captive screw **1**
   - Early type of drawer cover, left-hand side diagram.
   - Late type of drawer cover, right-hand side diagram.
3. Pull the power control panel **2** forward until it is free.

   Note: If the 2105 rack is powered on, the SSA DASD drawers internal dc power will come on (if previously powered off) when the control panel assembly is removed. The dc power remains powered on when the power control panel is reinstalled.
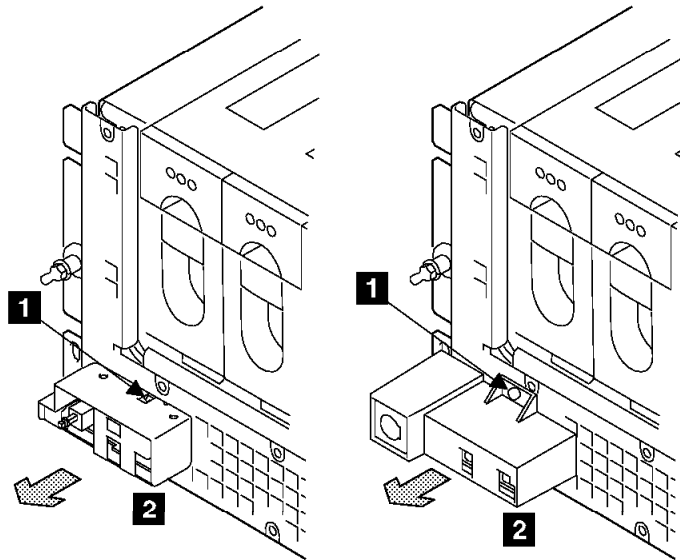

Figure 24. Drawer Power Control Panel (t007240m)

4. Replace parts in the reverse order, then return to the service guide or service terminal procedure that sent you here.

Drawer Power Distribution Tray Assembly Removal and Replacement, Model 020 Drawer

This procedure is for SSA DASD Model 020 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Attention: If you are servicing the SSA DASD drawer concurrently, with power on, ensure that you remove only one power distribution tray.

Note: Unless you have a particular reason, *do not power off the 2105 or SSA DASD drawer when removing power distribution tray assemblies*

Unless you have a particular reason, *do not power off the 2105 or SSA DASD drawer when removing power distribution tray assemblies.*

The diagrams in this procedure show the SSA DASD Model 010 drawer. The procedure for an SSA DASD Model 020 drawer are the same.

1. Open the front cover of the 2105 Model 100 rack and locate the SSA DASD drawer with the power distribution tray you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.

   - Right power distribution tray, not visible (DRAWERdd-V9)

   - Left power distribution tray, not visible (DRAWERdd-V10)

2. Remove the drawer control panel assembly **4** , see "Drawer Power Control Panel Removal and Replacement, Model 020 Drawer" on page 47.

3. Unscrew the 13 captive screws **1** , **3** , and **5** , and remove the RFI shield **2** .
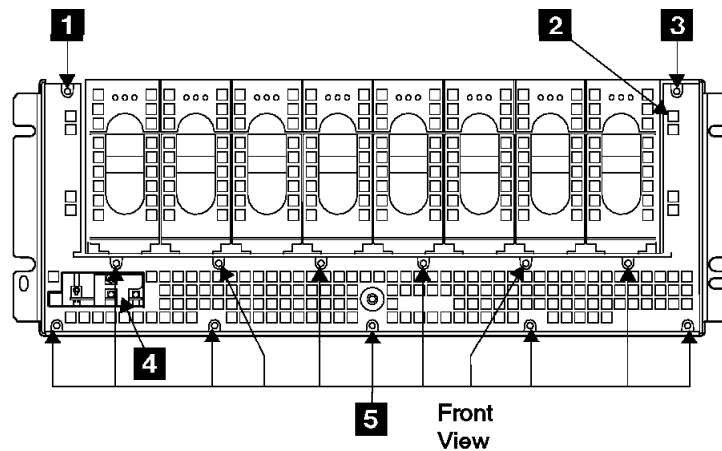
Figure 25. Drawer Power Distribution Tray (t007069m)

4. Locate the drawer power distribution tray assembly you will be removing:

   - Right power distribution tray (DRAWERdd-V9) **7** .

   - Left power distribution tray (DRAWERdd-V10) **6** .

5. **Attention** Errors will occur if you disconnect the power connector to the left and right power distribution trays while the SSA DASD drawer is running. Disconnect both power connectors only when instructed to do so (for example, the removal of a front or rear backplane assembly).

   Disconnect the power card cable from the power distribution tray you are removing:

   - Right power distribution tray power cable **12** .

   - Left power distribution tray power cable **9** .

6. Unscrew the two captive screws on the power distribution tray you are removing:

   - Right power distribution tray **11** and **13** .

   - Left power distribution tray power cable **8** and **10** .

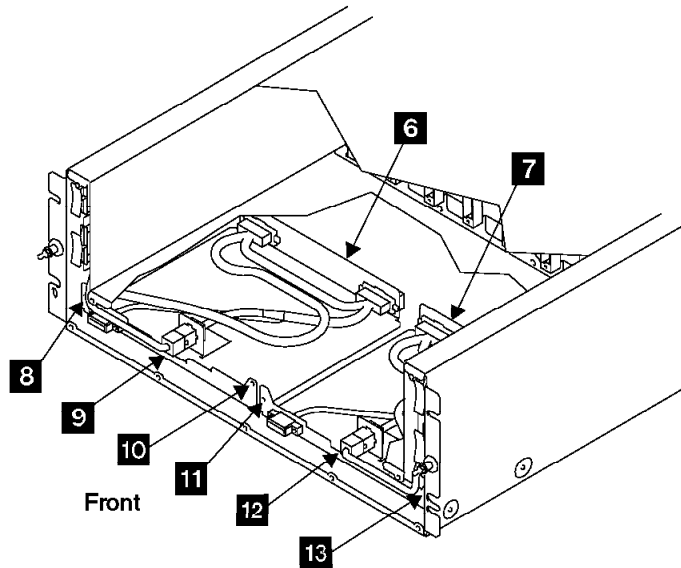## Power Distribution Tray Assembly

Figure 26. Drawer Power Distribution Tray Removal (t007073m)

7. **Attention** Each power distribution tray assembly consists of a connector tray and a power card:

   • Right power distribution tray assembly
     – Right power connector tray **16**
     – Right power card **17**
   • Left power distribution tray assembly
     – Left power connector tray **15**
     – Left power card **14**

   Pull the power card next to the power distribution tray you are removing forward until it releases from the backplane connector.
8. Carefully pull the power distribution tray assembly (power card and connector tray), out from the SSA DASD drawer.
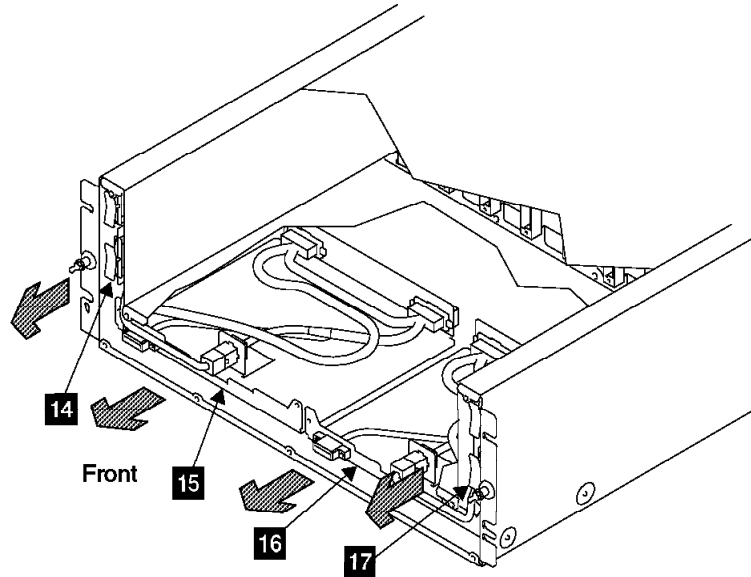
Figure 27. Drawer Power Distribution Tray Assembly Removal (t007075m)

9. Replace parts in the reverse order.

   Notes:

   a. When installing the power-distribution tray assembly, insure that you push both the connector tray and the power card in until seated.

   b. When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.

Drawer Back Power Card Removal and Replacement, Model 020 Drawer

This procedure is for SSA DASD Model 020 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Attention: If you are servicing the SSA DASD drawer concurrently, with power on, ensure that you remove only one back power card. "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not power off the SSA DASD drawer when removing a back power card*.

1. Open the front cover of the 2105 Model 100 rack and locate the SSA DASD drawer with the back power card you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.

   • Back power card, right, not visible (DRAWERdd-C5)

   • Back power card, left, not visible (DRAWERdd-C6)

2. Remove the drawer control panel assembly ◢, see "Drawer Power Control Panel Removal and Replacement, Model 020 Drawer" on page 47.

Back Power Cards

3. Unscrew the 13 captive screws **1** , **3** , and **5** , and remove the RFI shield **2** .
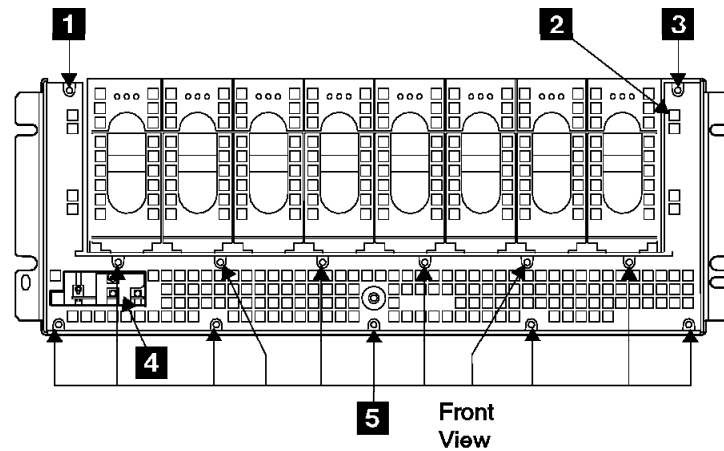

Figure 28. Drawer Back Power Cards (t007069m)

4. Locate the drawer back power card you will be removing:
   - Back power card, right (DRAWERdd-C5) **7** .
   - Back power card, left (DRAWERdd-C6) **6** .
5. **Attention** Errors will occur if you disconnect the power connector to the left and right back power cards while the SSA DASD drawer is running. Disconnect both power connectors only when instructed to do so (for example, the removal of a front or rear backplane assembly).

   Disconnect the power card cable from the back power card you are removing:
   - Back power card, right power cable **9** .
   - Back power card, left power cable **8** .
6. Pull the back power card you are removing forward until it releases from the backplane connector.
   - Back power card, right **7** .
   - Back power card, left **6** .
7. Carefully pull the back power card out of the SSA DASD drawer.
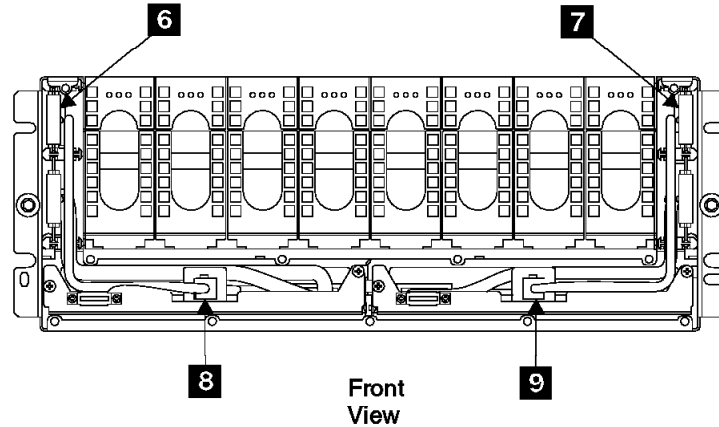
Figure 29. Drawer Back Power Cards Removal (t007078m)

8. Replace parts in the reverse order.

   Notes:

   a. When installing the back power card, insure that you push it in until seated.

   b. When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.

Drawer Bypass Card Removal and Replacement, Model 020/040 Drawer

This procedure is for SSA DASD Model 020 and 040 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not power off the SSA DASD drawer when removing a bypass card*.

1. Open the rear cover of the 2105 Model 100 rack and locate the SSA DASD Model 020 or 040 drawer with the bypass card you will be removing.

   • Bypass card, upper left (DRAWERdd-C1) **1**

   • Bypass card, lower left (DRAWERdd-C5) **3**

   • Bypass card, upper right (DRAWERdd-C2) **2**

   • Bypass card, lower right (DRAWERdd-C6) **4**

   SSA DASD Model 020 drawer shown.

Bypass Card
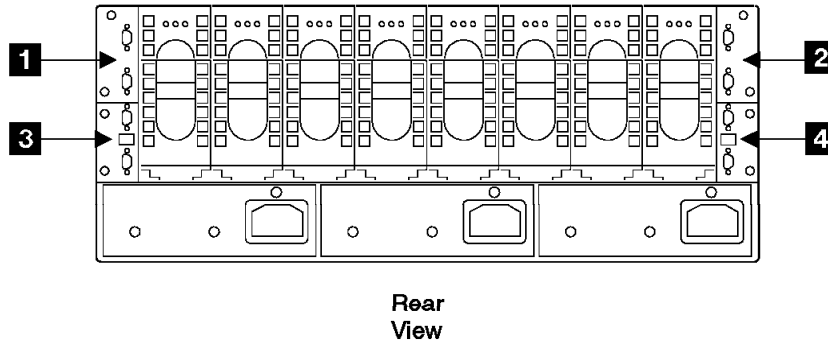
Figure 30. Bypass Card Locations (t007248m)

2. Disconnect the SSA device cables from the bypass card you are going to remove.

   Note: To prevent damage to the SSA device cable connector screws, always use the special screwdriver (SSA tool, P/N 32H7059) to turn them. This screwdriver is in the 2105 ship group.

   - Upper left bypass card, disconnect J4 and J5 **6**
   - Lower left bypass card disconnect, J8 and J9 **5**
   - Upper right bypass card disconnect, J1 and J16 **7**
   - Lower right bypass card, disconnect J13 and J12 **8**

   Note: For concurrent repairs, remove and replace only one bypass card at a time. SSA DASD Model 020 drawer shown.
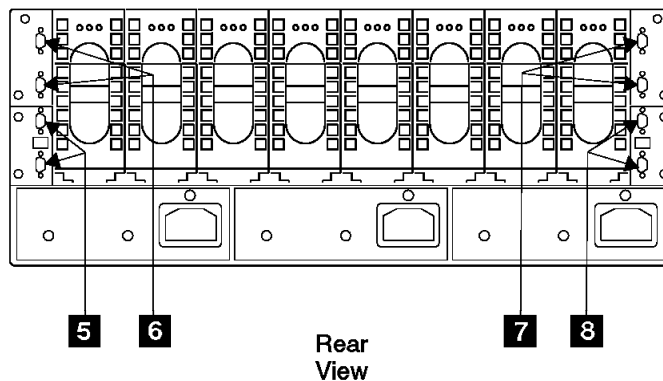
Figure 31. Bypass Card SSA Device Cables (t007079m)

3. Unscrew the two captive screws on the bypass card you are replacing and pull the card out of the SSA DASD drawer.

   - Upper left bypass card **9**
   - Lower left bypass card **11**
   - Upper right bypass card **10**
   - Lower right bypass card **12**

   SSA DASD Model 020 drawer shown.

Rear
View
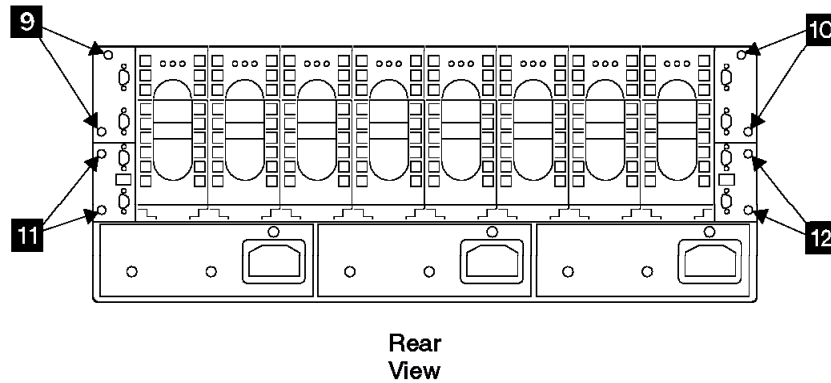
Figure 32. Bypass Card Removal (t007081m)

4. Determine if you are working on a SSA DASD Model 020 or 040 drawer
   - Model 020 Drawer, go to step 5.
   - Model 040 Drawer, go to step 12 on page 56.
5. Determine if you are replacing the bypass card or verifying its jumper settings.
   - If you are replacing the bypass card, go to step 9 on page 56.
   - If you are verifying the bypass card jumper settings: go to step 6.
6. Determine if you are checking the jumper settings on an early type card, see Figure 33 or a late type card, see Figure 34 on page 56.
   - If checking an early type of bypass card (two 24 pin jumper blocks at each end), go to step 7.
   - If checking a late type of bypass card (one three pin jumper block), go to step 10 on page 56.
7. Verify that the jumpers on the early type bypass card are set to bypass mode.

   With the new bypass card laying flat with its components up and its SSA connectors **13** and **14** to the left. Verify that the jumpers on J3 **15** and J4 **16** are set as shown.

   Note: These are the only jumper settings that SSA DASD Model 020 drawer installed in the 2105 subsystem use.
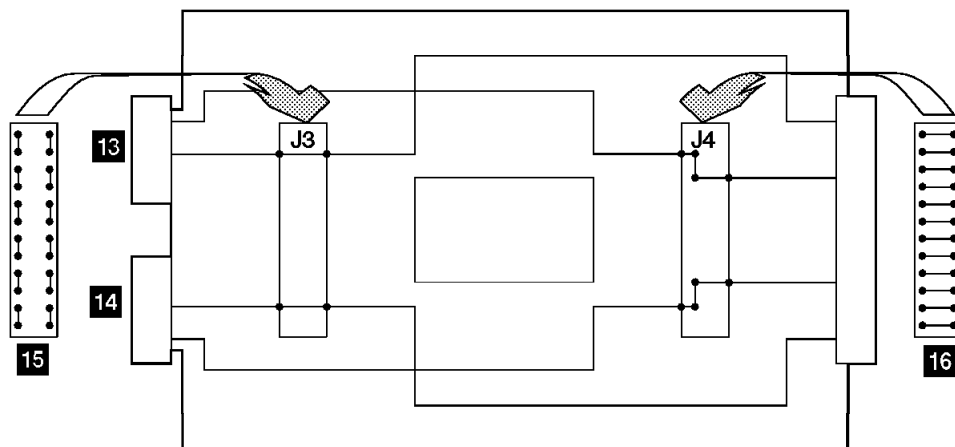
Figure 33. SSA DASD Model 020 Drawer Bypass Card Jumper Settings, Early Type (t007082m)

Bypass Card

8. Continue with step 13 on page 57.

9. Unpack the new bypass card and inspect the component side of the card. Verify that the card is a late type of bypass card. Late type cards have one three pin jumper block, see Figure 34. Go to step 10.

   Note: Replacement bypass cards must always be the late type shown in Figure 34.

10. Set the jumpers on the new bypass card (late type) to bypass mode.

    With the new bypass card laying flat with its components up and its SSA connectors **17** and **18** to the left. Verify that the jumper is installed on pins 1 and 2 **19** as shown.

    Note: This is the only jumper setting that SSA DASD Model 020 drawer installed in the 2105 subsystem use.
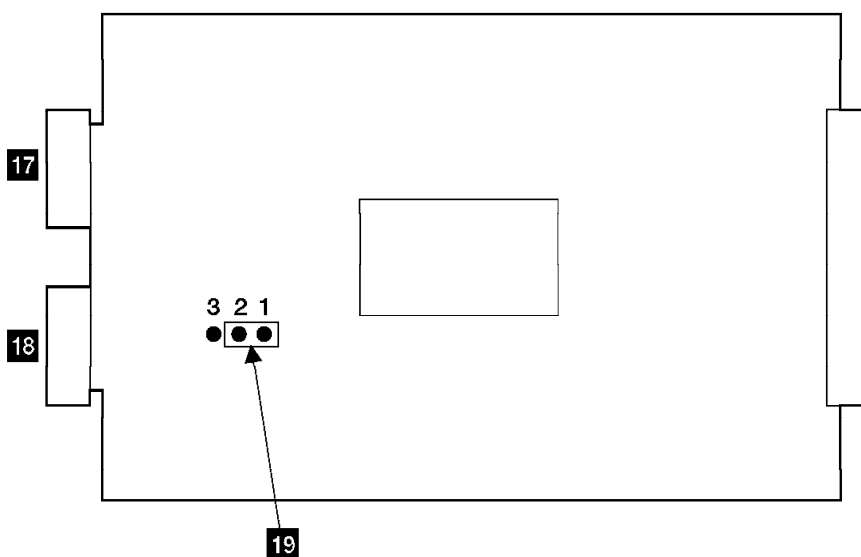
Figure 34. SSA DASD Model 020 Drawer Bypass Card Jumper Settings, Late Type (t007480m)

11. Continue with step 13 on page 57.

12. Set the jumpers on the new bypass card to bypass mode (automatic mode).

    With the new bypass card laying flat with its components up and its SSA connectors **20** and **21** to the left. Verify that the jumpers are installed on pins 2 and 3 **22** and **23** as shown.

    Note: This is the only jumper setting that SSA DASD Model 040 drawer installed in the 2105 subsystem use.
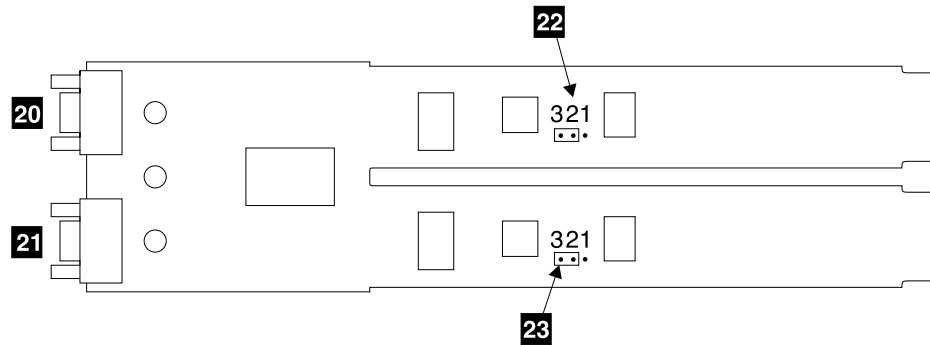
22

20

321

321

21

23

Figure 35. SSA DASD Model 040 Drawer Bypass Card Jumper Settings (t007574l)

13. Replace parts in the reverse order, remember to reconnect the SSA device cables to the bypass card.

   Notes:

   a. When installing a bypass cards, insure that you push it in until it is seated.

   b. When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.

Drawer Front Backplane Assembly Removal and Replacement, Model 020 Drawer

This procedure is for SSA DASD Model 020 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

1. Open the front cover of the 2105 Model 100 rack and locate the SSA DASD drawer with the front backplane you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.

   • Front backplane assembly, not visible (DRAWERdd-P1)

2. Power off the SSA DASD drawer, see "SSA DASD Drawer Power On and Off Procedure, Model 020 Drawer" on page 37.

3. Carefully note the position of each disk drive module in the front of the SSA DASD drawer and mark them 1 - 8. For disk drive module locations and numbers, see "Disk Drive Module Locations in a SSA DASD Drawer" on page 36.

4. Remove all the disk drive modules and dummy disk drive modules, if present, from the front of the SSA DASD drawer, see "Drawer SSA Disk Drive Module Removal and Replacement, Model 020/040 Drawer" on page 39.

   Attention Handle the disk drive modules gently, and use care when placing them on the ESD mat. Always sit them down in the same position and order as they were in the drawer.

5. Remove the drawer control panel assembly █4█ , see "Drawer Power Control Panel Removal and Replacement, Model 020 Drawer" on page 47.

Front Backplane Assembly

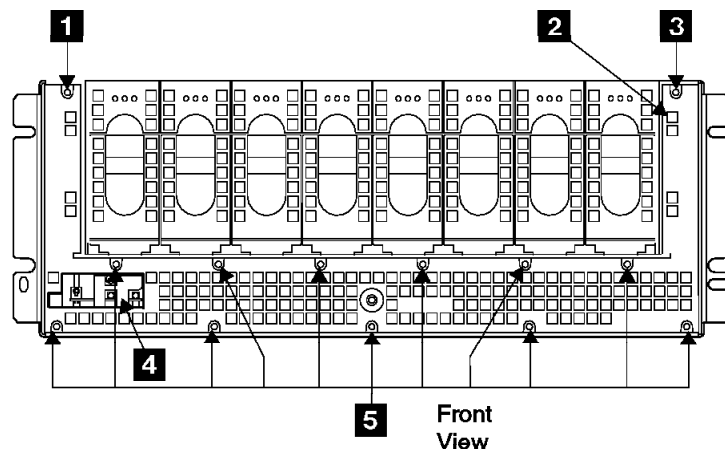6. Unscrew the 13 captive screws `1`, `3`, and `6`, and remove the RFI shield `2`.

Figure 36. Drawer Front Backplane (t007069m)

7. Open the rear cover of the 2105 and disconnect the SSA device cables from the rear of the SSA DASD drawer.

   Note: To prevent damage to the SSA device cable connector screws, always use the special screwdriver (SSA tool, P/N 32H7059) to turn them. This screwdriver is in the 2105 ship group.

   SSA DASD Model 020 drawer, disconnect SSA device cables from all four bypass cards `6`, `7`, `8`, and `9`.

8. Remove signal or bypass cards.

   SSA DASD Model 020 drawers, remove all four bypass cards `6`, `7`, `8`, and `9`, see "Drawer Bypass Card Removal and Replacement, Model 020/040 Drawer" on page 53.
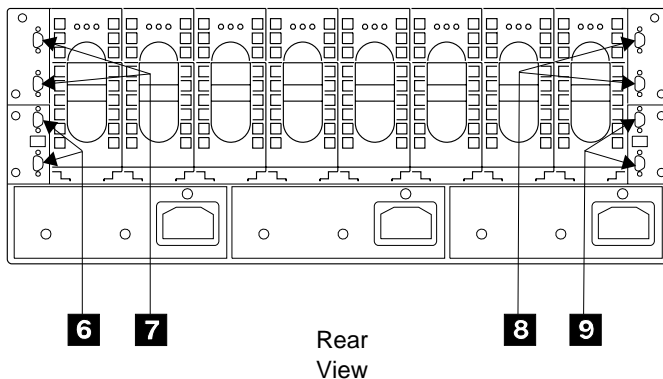
Figure 37. SSA DASD Drawer SSA Device Cable Connectors (t007505m)

9. Go to the front of the drawer and gently pull the two front power cards `13` and `14` out as far as their cables allow.

10. Reach into the front of the SSA DASD drawer and unscrew the four captive screws `10`, and remove the bracket assembly `11`.

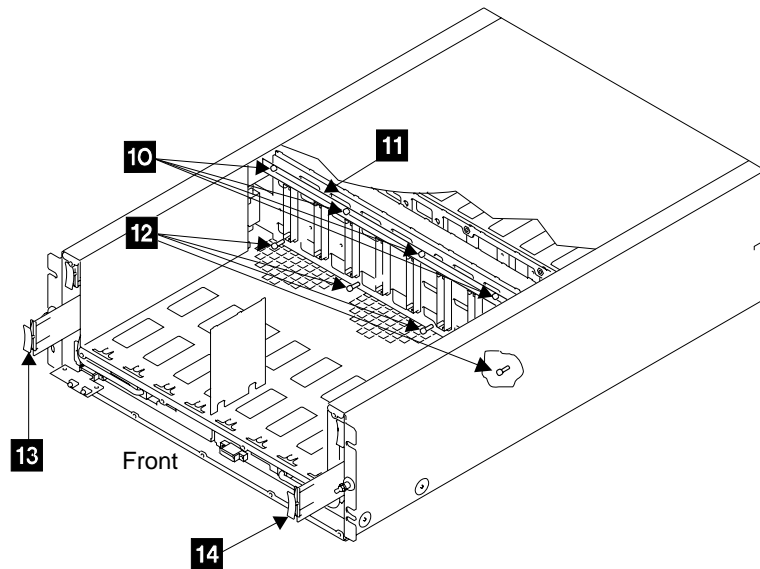11. Unscrew the four captive screws on the backplane assembly ▉12▉ .

Figure 38. Front Backplane Assembly Mounting (t007083m)

12. Pull the right side of the backplane assembly ▉15▉ toward you, then pull the backplane assembly out through the front of the SSA DASD drawer
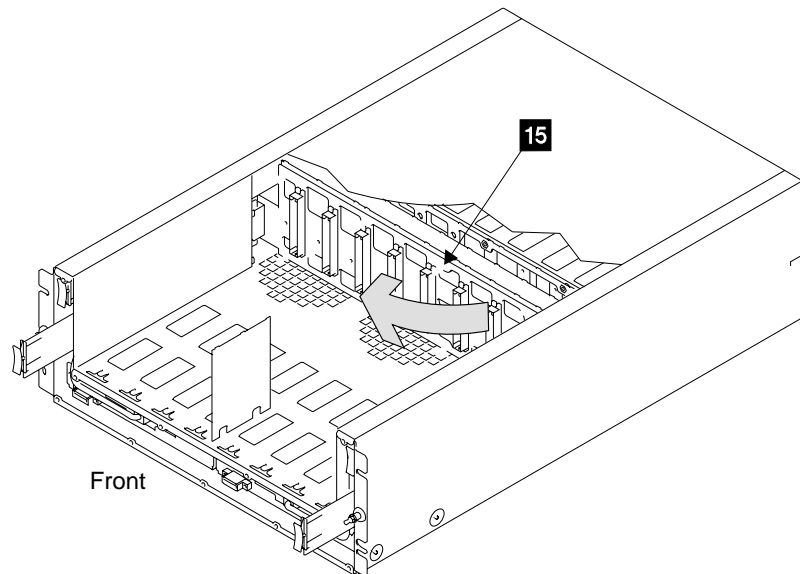

Figure 39. Front Backplane Assembly Removal (t007085m)

13. Replace parts in the reverse order.

   Notes:

   a. Do not tighten the four captive screws in the backplane or the bracket until after you have reinstalled the power cards and bypass cards. The cards can be plugged in more easily if the backplane assembly is free to move slightly

   b. When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.

Drawer Back Backplane Assembly Removal and Replacement, Model 020 Drawer

This procedure is for SSA DASD Model 020 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

1. Open the front cover of the 2105 Model 100 rack and locate the SSA DASD drawer with the back backplane you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.

   • Back backplane assembly, not visible (DRAWERdd-P2)

2. Power off the SSA DASD drawer, see "SSA DASD Drawer Power On and Off Procedure, Model 020 Drawer" on page 37.

3. Remove the two back power cards from the front of the SSA DASD drawer, see "Drawer Back Power Card Removal and Replacement, Model 020 Drawer" on page 51.

4. Open the rear cover of the 2105 Carefully note the position of each disk drive module in the rear of the SSA DASD drawer and mark them 9 - 16. For disk drive module locations and numbers, see "Disk Drive Module Locations in a SSA DASD Drawer" on page 36.

5. Remove all the disk drive modules, from the rear of the SSA DASD drawer, see "Drawer SSA Disk Drive Module Removal and Replacement, Model 020/040 Drawer" on page 39.

   Attention: Handle the disk drive modules gently, and use care when placing them on the ESD mat. Always sit them down in the same position and order as they were in the drawer.

6. Disconnect the SSA device cables from the rear of the SSA DASD drawer.

   Note: To prevent damage to the SSA device cable connector screws, always use the special screwdriver (SSA tool, P/N 32H7059) to turn them. This screwdriver is in the 2105 ship group.

   Disconnect the SSA device cables from all four bypass cards **1** , **2** , **3** , and **4** .

7. Remove all four bypass cards **1** , **2** , **3** , and **4** , see "Drawer Bypass Card Removal and Replacement, Model 020/040 Drawer" on page 53.
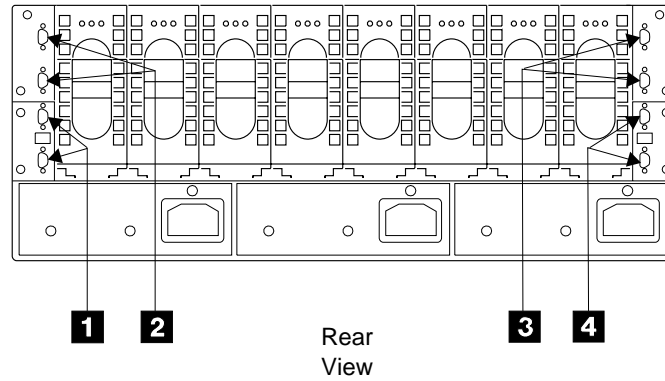
Figure 40. SSA DASD Drawer SSA Device Cable Connectors (t007506m)

8. Reach into the rear of the SSA DASD drawer and unscrew the four captive screws **5**, and remove the bracket assembly **6**.

9. If you are servicing a SSA DASD Model 020 drawer, remove the two self-adhesive plastic air baffles (P/N 31H8722) **7** and **8**.

    Note: You will need to install two new plastic air baffles when reinstalling the back backplane assembly.

10. Unscrew the four captive screws on the backplane assembly **9**.
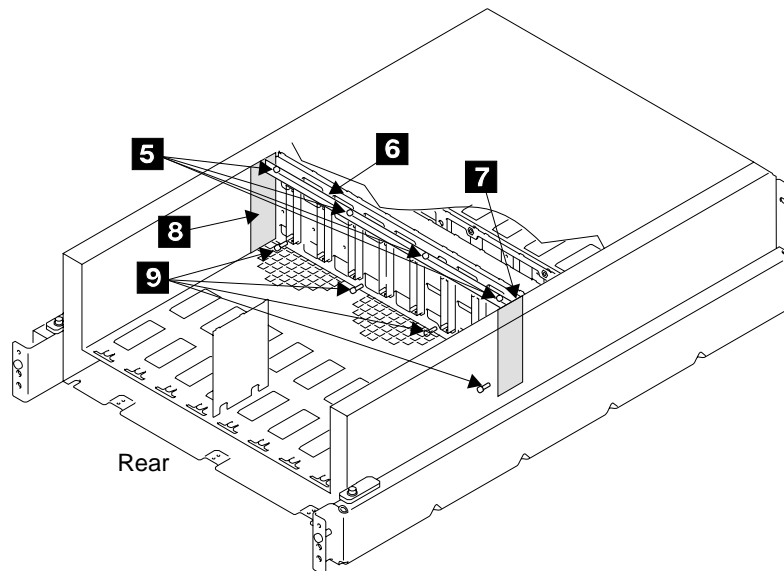
Figure 41. Back Backplane Assembly Mounting (t007087m)

11. Pull the right side of the backplane assembly **10** toward you, then pull the backplane assembly out through the rear of the SSA DASD drawer

Back Backplane Assembly
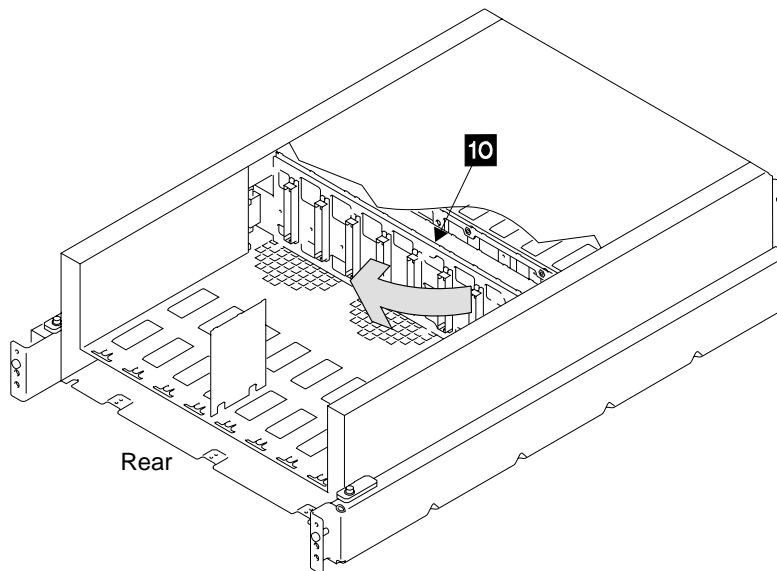
Figure 42. Back Backplane Assembly Removal (t007089m)

12. Replace parts in the reverse order.

    Notes:

    a. Do not tighten the four captive screws in the backplane or the bracket until after you have reinstalled the power cards and bypass cards. The cards can be plugged in more easily if the backplane assembly is free to move slightly

    b. If you are servicing a SSA DASD Model 020 drawer, ensure that you install two new plastic air baffles (P/N 31H8722). The baffles are self-adhesive. Pull off the protective cover, and attach the baffles.

    c. To prevent damage to the SSA device cable connector screws, always use the special screwdriver (SSA tool, P/N 32H7059) to turn them. This screwdriver is in the 2105 ship group.

    d. After the repair is complete, return to the service guide procedure that sent you here or return to the service terminal for testing instructions.

    e. When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.

Drawer Controller Card Removal and Replacement, Model 040 Drawer

This procedure is for SSA DASD Model 040 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not power off the SSA DASD drawer when removing a controller card*.

1. Open the front cover of the 2105 Model 100 rack and locate the SSA DASD Model 040 with the controller card you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.
   - Controller card assembly (DRAWERdd-C5) **1**
2. Unscrew the two captive screws **2** and **3**, on the controller card being replaced.
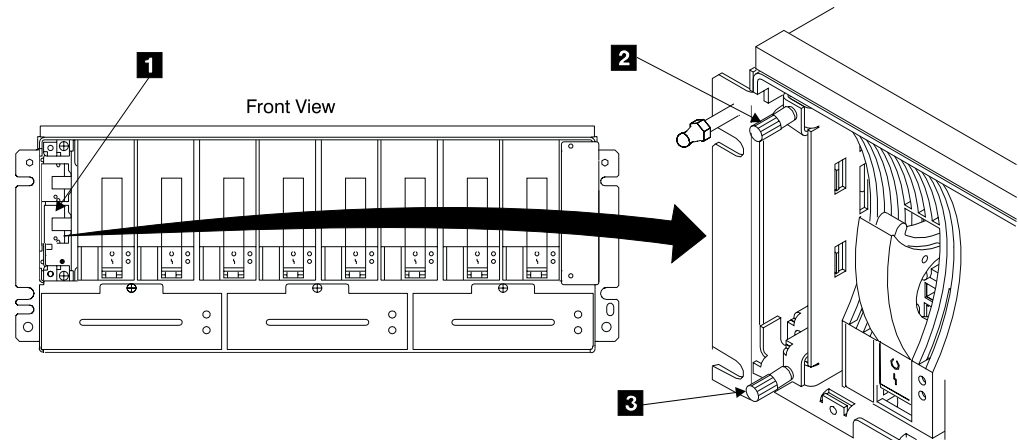3. Pull the controller card **1**, out of the SSA DASD Model 040.

Figure 43. Controller Card Removal (t007578m)

4. Replace parts in the reverse order.

   Notes:

   a. When installing a controller cards, insure that you push it in until it is seated.

   b. **Attention:** After the new controller card is installed, go to the rear of the drawer. Power both drawer power supplies off, pull the switches out then push them down. Wait 20 seconds. Power both drawer power supplies on, pull the switches out then push them up.

   c. When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.

Drawer Power Supply Assembly Removal and Replacement, Model 040 Drawer

This procedure is for SSA DASD Model 040 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Attention: If you are replacing the power supply assembly concurrently, with power on, insure that you power off or remove only one power supply assembly removed from the SSA DASD Model 040 at a time.

Note: Unless you have a particular reason, *do not power off the 2105 Model 100 or SSA DASD drawer when removing a power supply assembly*.

Power Supply Assembly

1. Open the rear cover of the 2105 Model 100 rack and locate the SSA DASD drawer with the power supply assembly you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.

   - Power supply assembly 1 (DRAWERdd-V1) **1**
   - Power supply assembly 2 (DRAWERdd-V2) **2**

   The CHK/PWR (check/power) Good indicator on the power supply assembly you are replacing should be on.

   If the CHK/PWR (check/power) Good indicator is not on, verify that you are working on the correct rack, drawer, and power supply assembly.

   Note: With some failures, the indicator will not turn on. If this is the case, verify again that you are working on the correct power supply assembly then continue with the next step.

2. Switch off the power supply assembly that you are replacing. Pull the PWR/FAULT RESET switch **3** out then push it down.

   Power supply assembly 1 shown.

3. Unplug the power cable **3** from the power supply assembly that you are replacing.

   Power supply assembly 1 shown.
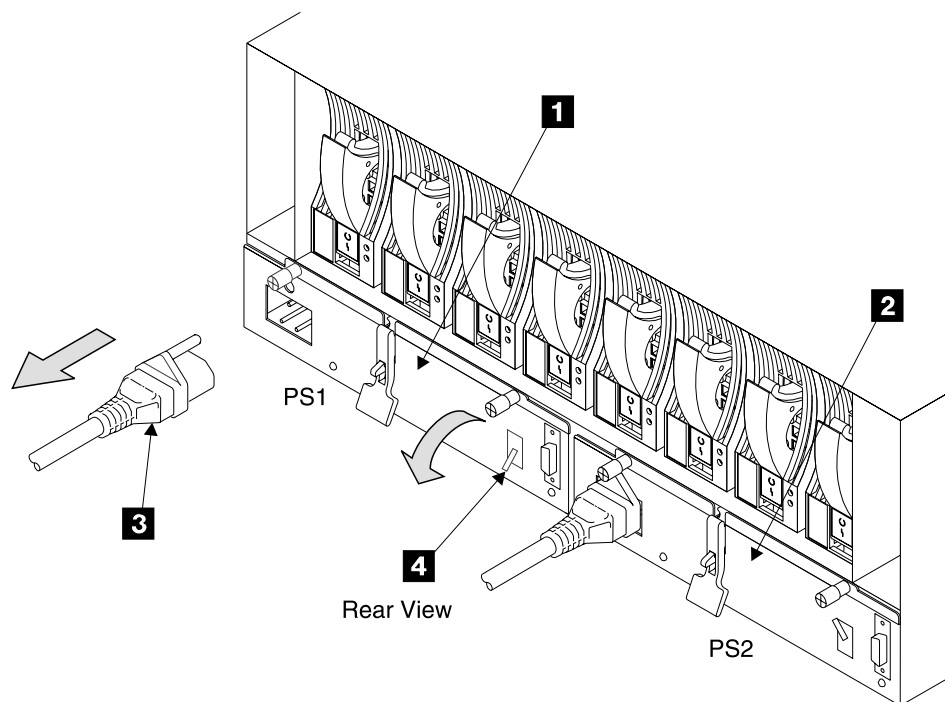
Figure 44. Model 040 Drawer Power Supply Assembly Locations (t007576m)

4. Unscrew the two thumb screws **5** and **6** .

   Power supply assembly 1 shown.

5. Press the latch **7** , and pull the lever up **8** , on the power supply assembly you are removing. Pull the assembly out of the SSA DASD drawer.

DANGER

Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit. (1008)
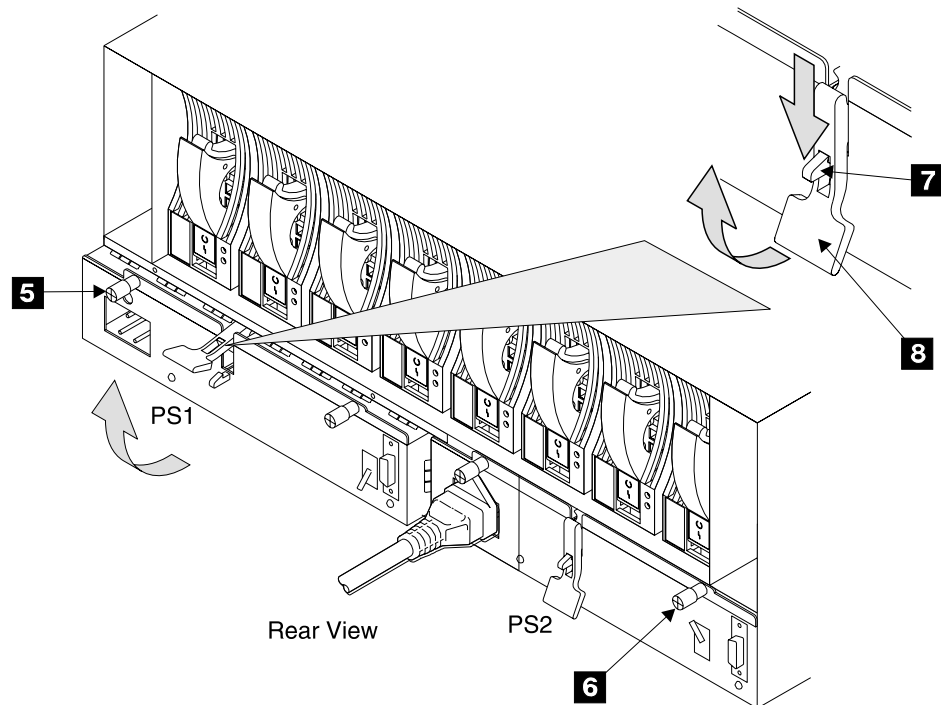

Figure 45. Model 040 Drawer Power Supply Assembly Locations (t007577n)

6. Replace parts in the reverse order, then continue with step 7.

7. Observe the PWR (power) indicator **9** or **10** , on the power supply assembly you just installed.

   Is the PWR (power) indicator on?

   • **Yes**, go to step 10 on page 66.

   • **No**, go to step 8 on page 66.
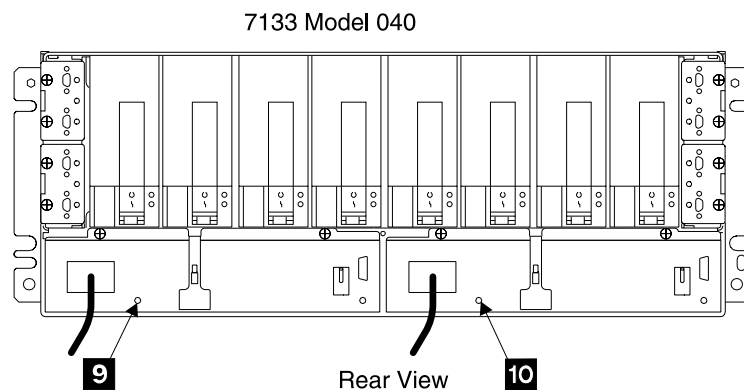
Figure 46. Power Supply Assembly Indicators (t007556l)

Power Supply Assembly

8. Power from the BPS to the power supply assembly may have automatically switched off in the BPS.

   a. Go to the operator panel on the front of the 2105 Model Exx/Fxx that this rack is attached to.

   b. Press the 2105 Model Exx/Fxx Local Power switch to On (|, up) **11** then release it.

   c. Return to the power supply assembly. Wait 15 seconds then observe the PWR (power) indicator again.

      Is the PWR (power) indicator on?

      • **Yes**, go to step 10.

      • **No**, go to step 9.
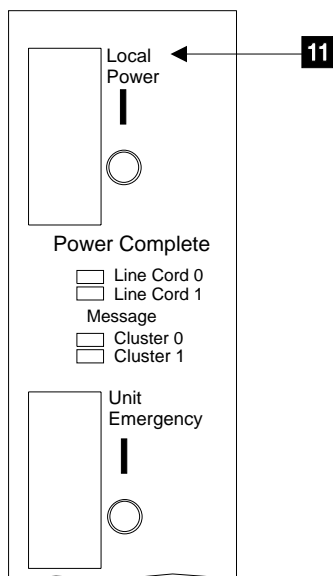
Figure 47. 2105 Model Exx/Fxx Operator Panel Locations (t007582m)

9. The PWR (power) indicator is off because of a failing bulk power supply or power supply assembly. Do one or both of the following:

   • Find the bulk power supply fault using "MAP 2000: Entry for Visual Power Symptoms" on page 19.

   • The new power supply assembly may be defective, replace it again.

10. Return to the procedure that sent you here.

Frame Assembly Removal and Replacement, Model 040 Drawer

This procedure is for SSA DASD Model 040 drawers only.

Notes:

1. **Use this procedure only if you are replacing the frame assembly of the Model 040 drawer. If you are removing a complete Model 040 drawer from the 2105 (for example, to locate it elsewhere), go to "Chapter 5. Install and Remove" on page 93.**

2. You will need another service representative to help you remove the frame assembly from the rack.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not power off the 2105 Model 100 when removing the frame assembly*.

Power cables and external SSA cables that connect the Model 040 drawer to the using system can be disconnected while that system is running.

1. Open the front and rear covers of the 2105 Model 100 rack and locate the SSA DASD Model 040 with the frame assembly you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.

   • Frame assembly 1 (DRAWERdd-U40) **1**

2. Power off both power supply assemblies in the Model 040 drawer. Pull both PWR/FAULT RESET switches, **4** in Figure 44 on page 64, out then push them down.

   Power supply assembly 1 shown.

3. Carefully make a note of the locations of the disk drive modules DDMs and dummy disk drive modules that are in the Model 040 drawer. This will aid in the reinstall of the DDMs into their original slots. Attach identifying labels to the DDMs.

4. Remove all the disk drive modules and dummy disk drive modules. See "Drawer SSA Disk Drive Module Removal and Replacement, Model 020/040 Drawer" on page 39.

5. Remove the three fan assemblies from the front of the Model 040 drawer, see "Fan Assembly Removal and Replacement, Model 040 Drawer" on page 69.

6. Remove the controller card assembly from the front of the Model 040 drawer, see "Drawer Controller Card Removal and Replacement, Model 040 Drawer" on page 62.

7. Remove the two power supply assemblies from the back of the Model 040 drawer, see "Drawer Power Supply Assembly Removal and Replacement, Model 040 Drawer" on page 63.

8. Make a note of which SSA cables are connected to each bypass card.

9. Disconnect the external SSA cables from all four bypass cards. To prevent damage to the SSA connector screws, use the special screwdriver (SSA tool, part 32H7059) to unscrew them. The screwdriver is supplied with the Model 040 drawer ship group. See "Drawer SSA Cable Removal and Replacement, Model 020/040 Drawer" on page 70.

10. Remove the four bypass cards, see "Drawer Bypass Card Removal and Replacement, Model 020/040 Drawer" on page 53.

11. Loosen the two screws **1** , and pivot the two clamp plates **2** away from the slots in the frame assembly.
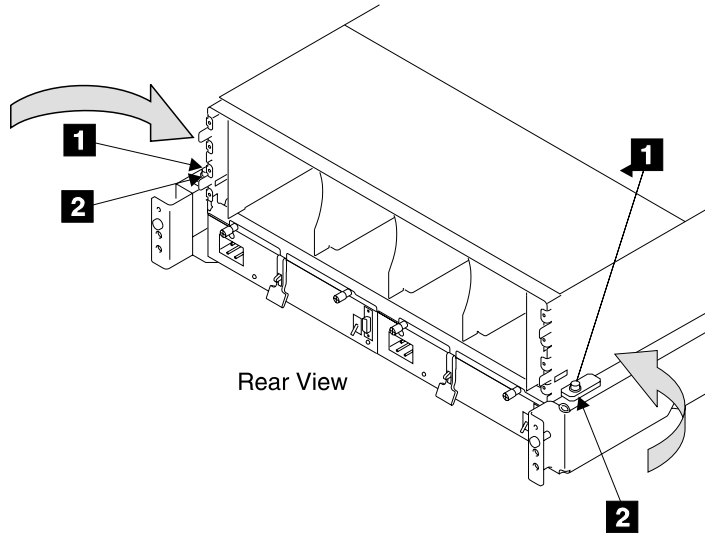
Frame Assembly

Figure 48. Moving the Frame Assembly Clamp Plates (t007580m)

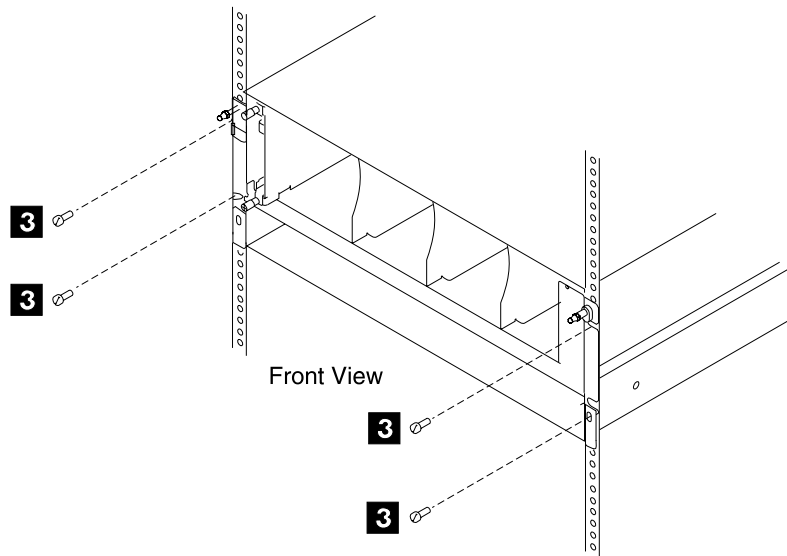12. Remove the four screws **3** from the front of the frame assembly.

Figure 49. Removing the Frame Assembly From the Rack (t007581m)

13. Read the following Caution notice before continuing.

    CAUTION:

    This unit weighs between 18 kg (39.7 pounds) and 32 kg (70.5 pounds). Two persons are required to safely move it. Using less than two persons to move it can result in injury. (1054)

    With aid from another service representative, pull the frame assembly forward and remove it from the 2105.

14. Transfer the plate with the serial number **4** or **5** , from the original frame assembly to the new frame assembly.

15. Model 040 drawer only, locate the blank label in the ship group. Copy the information from serial number label **5** , onto the blank label. Install the label on the front right mounting flange **6** .

7133 Model 020   7133 Model 040

Front View   **4**   Front View   **5** **6**
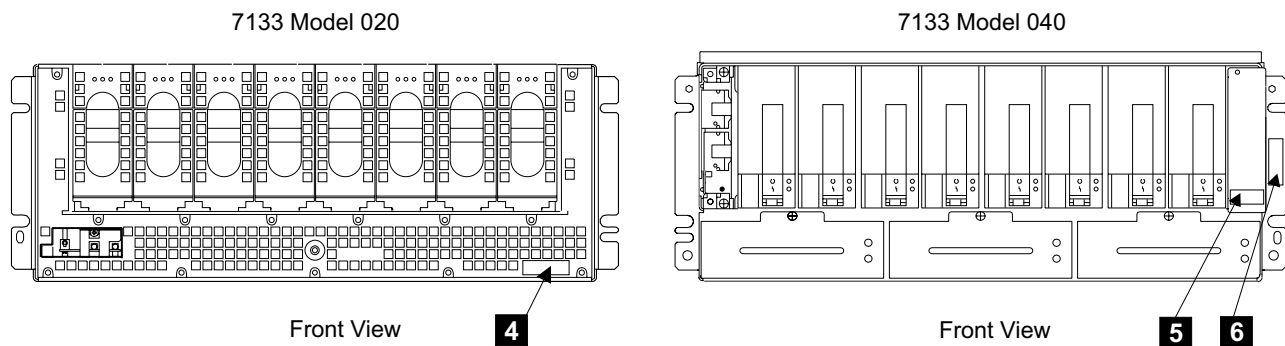
Figure 50. Model 040 Drawer Serial Number Plate Location (t007659l)

16. Replace parts in the reverse order.

    Notes:

    a. When you reinstall the frame assembly into the rack, reinstall the front mounting screws and the back clamp plates in the following sequence:

       1) Install the lower left-hand front mounting screw. This screw locates the 7133 laterally. Do not fully tighten the screw yet.

       2) Install the other three front mounting screws. Do not fully tighten the screws yet.

       3) Fully tighten the lower left-hand front mounting screw.

       4) Fully tighten the other three front mounting screws.

       5) At the back of the 7133, reinstall the back clamp plates and tighten their screws.

    b. When you reinstall the external SSA cables, use the special screwdriver (SSA tool, part 32H7059) to tighten the SSA connector screws.

17. Return to the procedure that sent you here.

Fan Assembly Removal and Replacement, Model 040 Drawer

This procedure is for SSA DASD Model 040 drawers only.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not turn off the 2105 Model 100 when removing the fan assembly*.

1. Open the front cover of the 2105 Model 100 rack and locate the SSA DASD Model 040 with the fan assembly you will be removing, see "SSA DASD Drawer Physical Location Codes" on page 183.

   • Fan assembly 1 (DRAWERdd-F1) **1**
   • Fan assembly 2 (DRAWERdd-F2) **2**

Fan Assembly

- Fan assembly 3 (DRAWERdd-F3) **3**

The Fan Check indicator **5** on the fan assembly you are replacing should be on.

Fan 1 shown.

If the Fan Check indicator is not on, verify that you are working on the correct rack, drawer, and fan power supply assembly.

> **Note:** With some failures, the amber CHK (check) indicator will not turn on. If this is the case, verify again that you are working on the correct fan assembly then continue with the next step.

2. Unscrew the thumbscrew **4** on the fan assembly you are replacing. Pull the fan out of the SSA DASD Model 040.
   Fan 1 shown.

> **Note:** The speed of the operating fans should increase and decrease as the failing fan is removed and replaced.
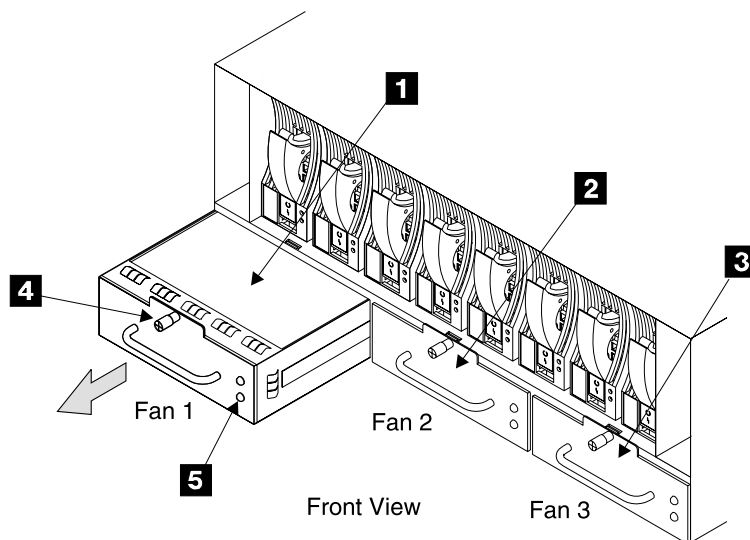
Figure 51. Model 040 Drawer Fan Assembly Locations (t007579m)

3. Replace parts in the reverse order.
4. Return to the procedure that sent you here.

Drawer SSA Cable Removal and Replacement, Model 020/040 Drawer

This procedure is for SSA DASD Model 020 and 040 drawers.

Notes:

1. SSA Cable FRU Kits have been developed for the following configurations.
   - Intra-subsystem cables (between subsystems) P/N34L89
   - Intra-subsystem cables (between subsystems) P/N 34L8986 (length, 25 meters)
   - Inter-rack cables (within a frame) P/N 34L8549 (length, 5 meters)
2. Unless you have a particular reason, *do not power off the SSA DASD drawer when replacing an SSA cable*.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

1. Determine which drawer SSA cable you are replacing using the physical location code and the information in "Chapter 7. 2105 Model 100 Locations" on page 173.

   - SSA Device Cable, SSA device card to SSA DASD drawer SSA connector (R1-Tx-P2-Kk-A#.1 or R1-Tx-P2-Kk-B#.1)

   - External SSA Cable, SSA DASD drawer 0 to SSA DASD drawer 6 external SSA cable (R1-DRAWERdd-J#.1)

   Record the connector location and number of both ends of the SSA cable being replaced. See Figure 52 and Figure 53 on page 72 for SSA cable connector locations.
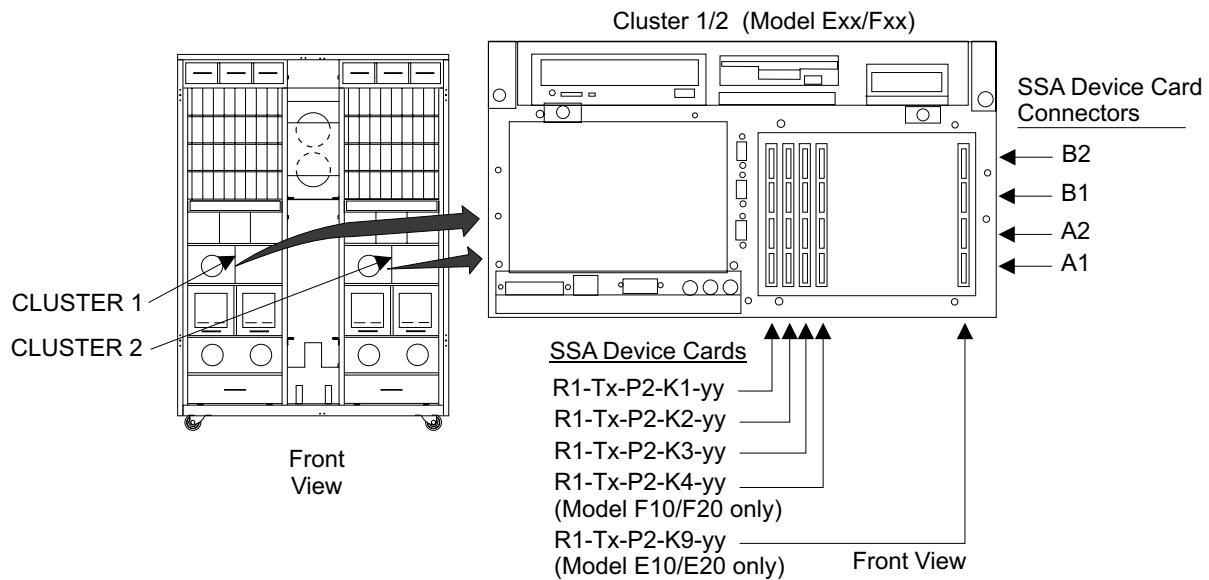
Figure 52. 2105 Model Exx/Fxx 4-Slot Bay Planar (s008022m)

Drawer SSA Cables

7133 Model 020

J4 → J1
J5 → J16
J8 → J13
J9 → J12

CHK PWR   CHK PWR   CHK PWR

Rear View

7133 Model 040

J4 → J1
J5 → J16
J8 → J13
J9 → J12

Rear View
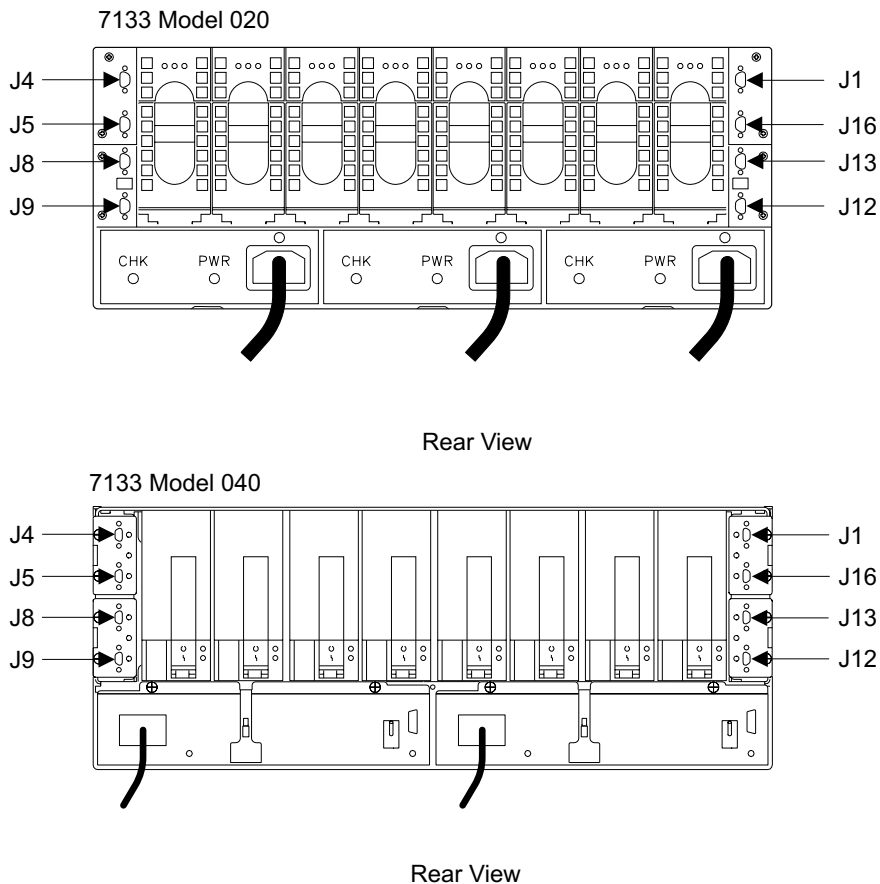
Figure 53. SSA DASD Model 020 and 040 Drawer SSA Connectors (s008762p)

2. Open the rear cover of the 2105 Model 100 rack and locate the SSA device card and SSA DASD drawer with the SSA cable you will be removing. See "SSA DASD Drawer Physical Location Codes" on page 183.

3. Disconnect the end of the SSA cable (source) identified in the location code and connect the new SSA cable to the same connector.

   Note: To prevent damage to the SSA device cable connector screws, always use the special screwdriver (SSA tool, P/N 32H7059) to turn them. This screwdriver is in the 2105 ship group.

4. Disconnect the other end of the old SSA cable and connect the new SSA cable to the same connector.

   Note: Allow the new cable to hang free until testing is complete.

5. Return to the service terminal and complete the repair procedure.

   Did repair verification show that the problem is resolved?

   - **Yes**, go to 7.
   - **No**, go to 6.

6. Remove the new SSA cable and reinstall the original cable, resolve the displayed problem.

7. Remove the old SSA cable from the rack and drawer retention while routing the new SSA cable in the same position using the same retention.

8. Go to the service terminal **Machine Checkout Menu** and select **SSA Loops Menu**. Select the SSA loop being repaired and press Enter to test.

Did the SSA loop test run without error?

- **Yes**, the problem is resolved.
- **No**, resolve the displayed problem.

2105 Model 100 Rack Power On and Off Procedures

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Rack Power Off
The 2105 Model 100s attached to an 2105 Model Exx/Fxx cannot be individually powered off. The entire 2105 Model Exx/Fxx subsystem must be powered off. Use the ″Rack, Subsystem Power On and Off Procedures, 2105 Model Exx/Fxx and Expansion Enclosure″ in chapter 4 of the 2105 Model Exx/Fxx service guide.

Rack Power On
The 2105 Model 100s attached to an 2105 Model Exx/Fxx cannot be individually powered on. The entire 2105 Model Exx/Fxx subsystem must be powered off, then on. Use the ″Rack, Subsystem Power On and Off Procedures, 2105 Model Exx/Fxx and Expansion Enclosure″ in chapter 4 of the 2105 Model Exx/Fxx service guide.

2105 Model 100 Rack Bulk Power Supply Removals and Replacements

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not power off the 2105 Model 100 rack when removing the bulk power supply or one of its components.*

1. Open the front or rear cover of the 2105 Model 100 rack and locate the bulk power supply you will be removing or replacing a component in:
   - 2105 Model 100 bulk power supply, front (V3) **1**
   - 2105 Model 100 bulk power supply, rear (V4) **2**

Bulk Power Supply
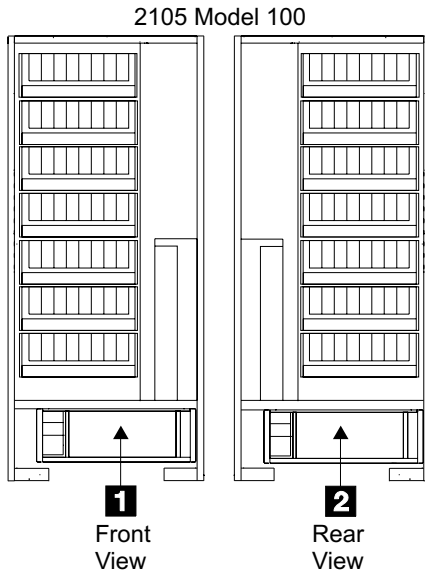
2105 Model 100

Figure 54. Bulk Power Supply Locations (t008977m)

2. Open the front or rear cover of the 2105 Model 100 you are working on.
   - Open the front cover for front bulk power supply repairs.
   - Open the rear cover for rear bulk power supply repairs.
3. Determine if a 350 V battery **3** is installed next to the BPS you are replacing:
   - If a 350 V battery is present, set the battery circuit breaker (CB) **4** to Off (O, down), then go to step 4.
   - If a 350 V battery is NOT present, continue with step 4.

   Note: 2105 Model 100 rack shown.
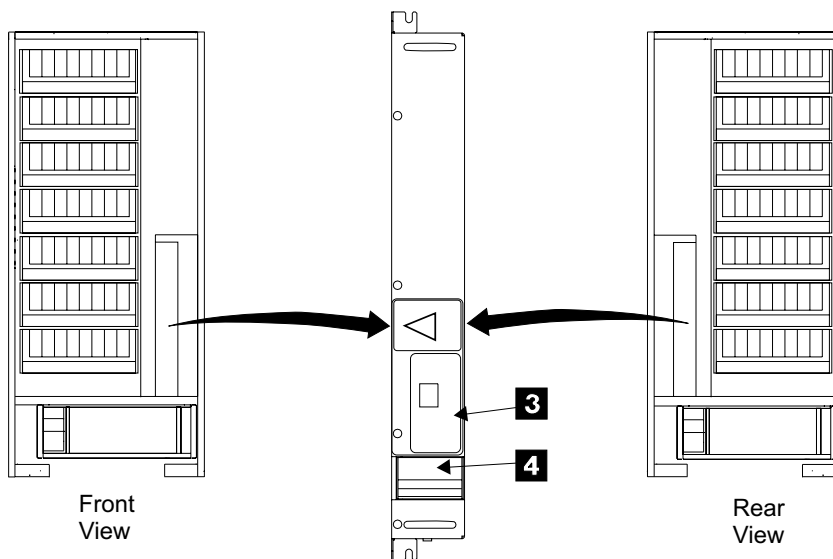
Figure 55. 350 V Battery Circuit Breaker Location (t008978m)

4. On the bulk power supply you are repairing, press the System Power circuit breaker (CB), **5** in Figure 56 on page 75, to Off (O, down).

5. Instruct the customer to switch off the circuit breaker that supplies mainline ac voltage to the power receptacle for the bulk power supply you are replacing.

6. Verify the customers circuit breaker is off. Attach a "Do Not Operate" tag, S229-0237, and the safety lockout padlock to the customer's ac voltage circuit breaker. Refer to the *Electrical Safety for IBM Customer Engineers* book.

7. Remove the two screws, **6** in Figure 56, then remove the mainline power cable retention plate **9** .

   Attention: For assembly, note how the mainline power cable ground strap, **7** in Figure 56, is clamped by the retention plate **9** and its lower mounting screw **6** .

8. Disconnect the mainline power cable from the bulk power supply J1 connector, **8** in Figure 56.
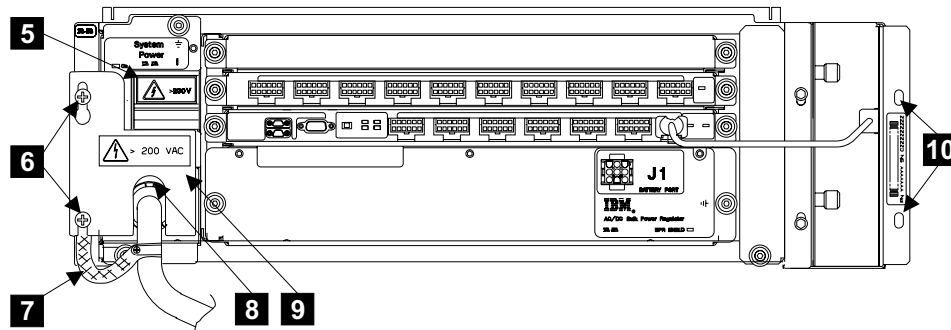
Figure 56. Bulk Power Supply Removal (t007126l)

9. Determine if you are replacing the entire BPS or one of its individual components (BPC, BPD, or BPR).

   Are you replacing the entire BPS assembly?

   - **Yes**, go to step 10.
   - **No**, go to step 15 on page 77.

10. Disconnect all cables from the bulk power supply. Pull these cables up and push them into an open area in the rack or retain them so they will not interfere with the removal of the BPS.

11. Locate the tailgate in front of the BPS you are replacing. Remove the EMC hardware and tailgate cable clamps that are retaining the cables. See "2105 Model 100 Tailgate Cable Clamp Removal and Installation" on page 131, then continue with step 13 on page 76.

12. Pull the tailgate cables up through the tailgate and push the loop of cables to the right side of the 2105 **11** . Make sure the cables are routed across the right side of the tailgate cross bar **12** , not the right side of the tailgate **13** .

Bulk Power Supply
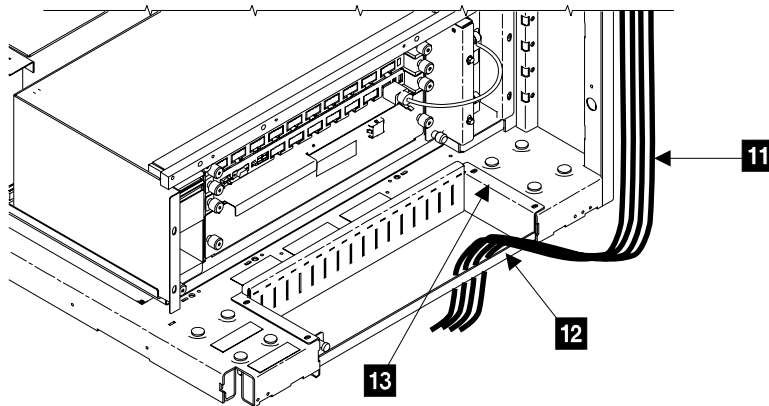
Figure 57. 2105 Tailgate Cable Position for BPS Replacement (t007491m)

CAUTION:

Do not continue with the inspection if any unsafe conditions are present. (1052)

13. Remove the two BPS mounting screws, **10** in Figure 56 on page 75.

   CAUTION:

   This unit weighs between 32 kg (70.5 pounds) and 55 kg (121.2 pounds). Three persons are required to safely move it. Using less than three persons to move it can result in injury. (1055)

   Slide the bulk power supply out of the frame.

14. Replace parts in the reverse order.

   Note: Verify that the new BPS System Power (CB) is set to Off (O, down) at the start of the replacement.

   Read the following Danger notice before continuing.

   DANGER

   Customers can be exposed to lethal AC voltages if the mainline power cable retention plate is not installed. Ensure that the mainline power cable retention plate is always installed before returning the machine to the customer. (1009)

   After the replacement do the following steps in the order shown:

   a. Set the customer mainline AC circuit breaker to on.

   b. Set BPS System Power circuit breaker (CB) **5**, in Figure 56 on page 75, to On (|, up).

   c. If a 350V battery is present, set the 350 V battery circuit breaker (CB) **4**, in Figure 55 on page 74, to On (|, up).

   d. Go to the operator panel on the front of the 2105 Model Exx/Fxx that this rack is attached to.

   e. Press the 2105 Model Exx/Fxx operator panel Local Power switch to On (|, up) **14**, in Figure 58 on page 77, then release it.

Note: When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.
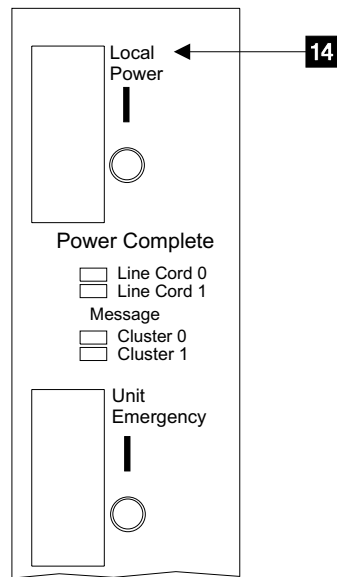
Figure 58. 2105 Model Exx/Fxx Operator Panel Switches (t007596m)

15. Use Figure 59 on page 78 to locate the bulk power supply component you are replacing: BPC, BPD, or BPR.

    Note: If the BPA fails, the entire BPS is replaced.

16. Do the following steps only on the BPS component you are replacing.

17. Disconnect all of the cables from the BPS component. Pull these cables up and push them into an open area in the rack so they will not interfere with the removal of the BPS component.

18. Loosen the two large BPS component mounting screws until they are free, then pull the BPS component from the BPS assembly.

    Attention: When reinstalling a BPS component, review the information on "2105 Bulk Power Supply Component Grounding" on page 199 for correct screw tightening information.

19. If you are replacing the BPC component, set the switches on the new BPC to the same positions as the old BPC.

20. Go to step 14 on page 76.

Mainline Power Cable

Bulk Power Supply (BPS)

BPA   BPC   BPD   BPR   BPF
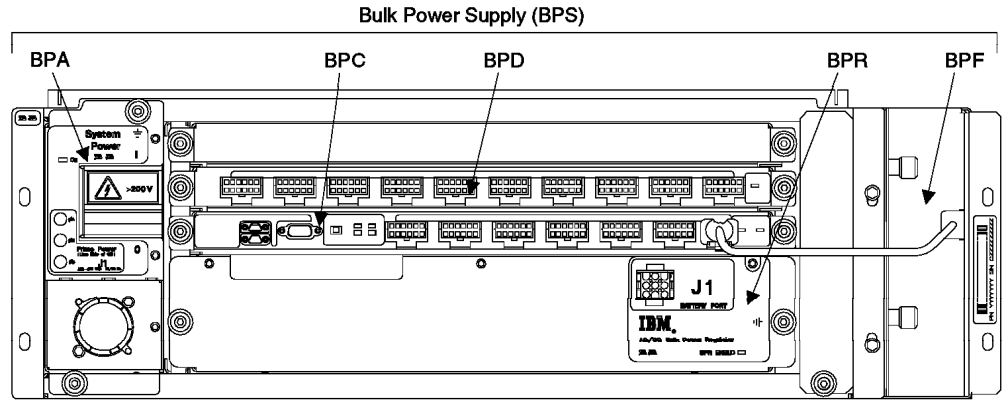
Figure 59. BPS Component Locations (t007488m)

Rack Mainline Power Cable Removal and Replacement

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not power off the 2105 Model 100 rack when removing the mainline power cable*.

1. Open the front or rear cover of the 2105 Model 100 rack and locate the bulk power supply (BPS) with the mainline power cable you will be removing:
   * 2105 Model 100 mainline power cable, front (V3-N1.1) **1**
   * 2105 Model 100 mainline power cable, rear (V4-N1.1) **2**

2105 Model 100

1
Front
View

2
Rear
View
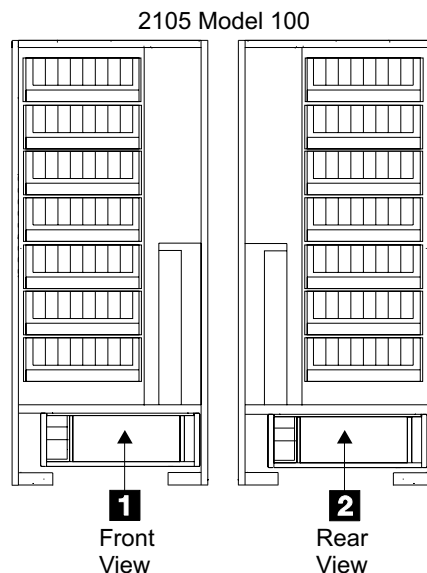
Figure 60. Bulk Power Supply Locations (t008977m)

2. Determine if a 350 V battery **3** is installed next to the BPS with the mainline power cable you are replacing:
   - If a 350 V battery is present, set the battery circuit breaker (CB) **4** to Off (O, down), then go to step 3.
   - If a 350 V battery is NOT present, continue with step 3.
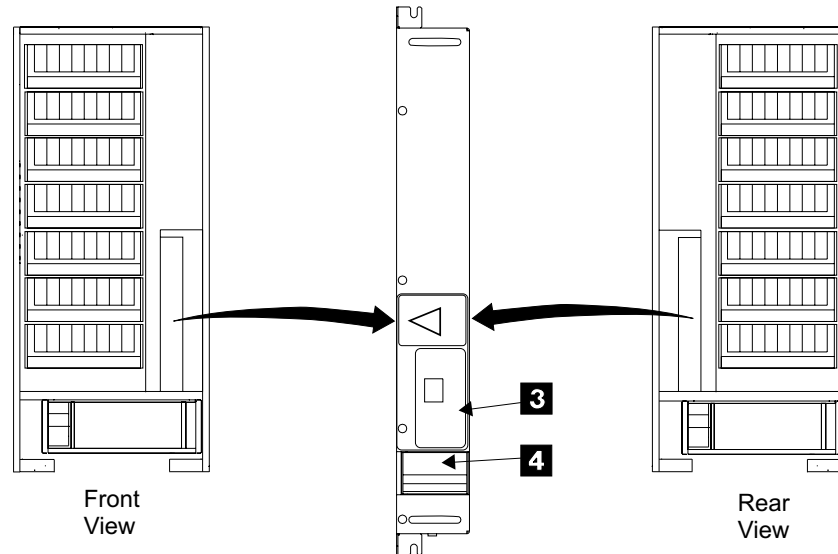
Figure 61. 350 V Battery Circuit Breaker Location (t008978m)

3. On the bulk power supply with the mainline power cable you are removing, press the System Power circuit breaker (CB), **5** in Figure 62 on page 80, to Off (O, down).

4. Instruct the customer to switch off the circuit breaker that supplies mainline ac voltage to the mainline power cable you are removing.

5. Attach a "Do Not Operate" tag (S229-0237) and the safety lockout padlock to the customer's ac mainline voltage circuit breaker. Refer to *Electrical Safety for IBM Customer Engineers* book.

6. Disconnect the mainline power cable from the customers AC power outlet:
   - Plug in connectors, you can disconnect.
   - Wired connection, instruct the customer to call a licensed electrician to disconnect the wired mainline power cable from the customers mainline power source.

7. Loosen the power cable retention plate top screw **6** and remove the bottom screw **7** .

8. Remove the mainline power cable retention plate **10** .

   Attention: For assembly, note how the mainline power cable ground strap **8** is clamped by the retention plate **10** and its lower mounting screw **7** .

9. Remove the EMC hardware then disconnect the tailgate cable strain relief clamp for the mainline power cable, "2105 Model 100 Tailgate Cable Clamp Removal and Installation" on page 131.

10. Disconnect the mainline power cable from the bulk power supply J1 connector **9** .

Mainline Power Cable
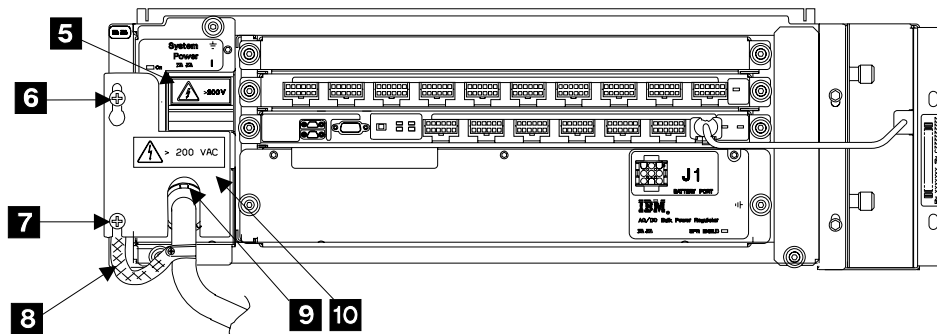
Figure 62. Bulk Power Supply Locations (t007133l)

11. Remove the mainline power cable from the 2105. With some installations you may have to remove the tailgate from the 2105 for additional clearance, see step 13 on page 103.

12. Read the following Danger notice before continuing.

    DANGER

    > **Customers can be exposed to lethal AC voltages if the mainline power cable retention plate is not installed. Ensure that the mainline power cable retention plate is always installed before returning the machine to the customer. (1009)**

    Replace parts in the reverse order.

    After the replacement, do the following steps in the order shown:

    a. Set BPS System Power circuit breaker (CB) **5**, in Figure 62, to On (|, up).

    b. If a 350V battery is present, set the 350 V battery circuit breaker (CB) **4**, in Figure 61 on page 79, to On (|, up).

    c. Go to the operator panel on the front of the 2105 Model Exx/Fxx that this rack is attached to.

    d. Press the 2105 Model Exx/Fxx operator panel Local Power switch to On (|, up) **11**, in Figure 63 on page 81, then release it.

    Note: When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.
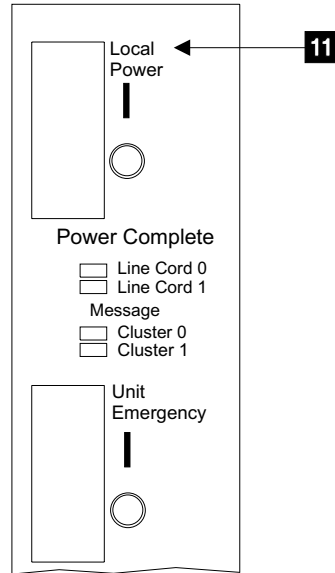
Figure 63. 2105 Model Exx/Fxx Operator Panel Switches (t007595m)

Rack Operator Panel Removal and Replacement

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not power off the 2105 Model 100 rack when removing the rack operator panel.*

1. Open the front cover of the 2105 Model 100 with the rack operator panel you will be removing.

   • Rack operator panel (L2) **1**
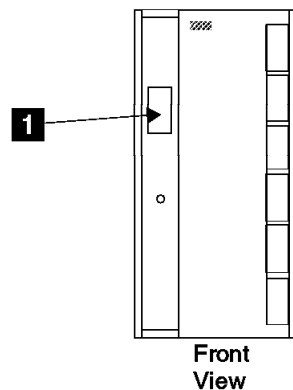
Figure 64. 2105 Model 100 Rack Operator Panel Location (t007135l)

2. Set the UEPO switch **2** on the front and rear bulk power supply assemblies to BYPASS (right).

Rack Operator Panel

Attention: If the UEPO switch on either bulk power supply is left in the BYPASS position for longer then one hour, a bulk power control (BPC) error will be posted.
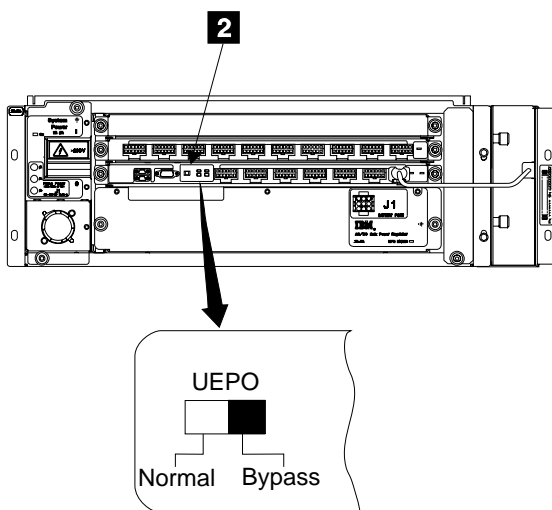
Figure 65. Bulk Power Supply Panel (t007503m)

3. Disconnect the cables from rack operator panel connectors J1 and J2 **3** from the top of the rack operator panel.

4. Press out on the retaining clips **5** and remove the rack operator panel **4** .

   Note: Rack operator panel housing **5** shown removed from door for clarity.
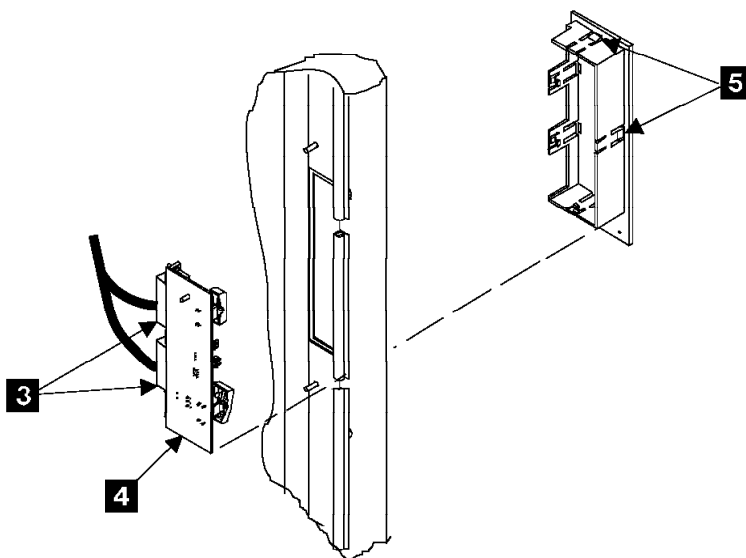
Figure 66. 2105 Model 100 Rack Operator Panel Removal (t007214m)

5. Replace parts in the reverse order.

   Note: After the repair is complete:

   a. Set the UEPO switch on the 2105 operator panel to On (|, up).

   b. Set the hidden UEPO switch **3** in Figure 97 on page 115, inside the door of the 2105 Model 100, to down.

   c. Set the UEPO switch, **2** in Figure 65 on page 82, on the front and rear bulk power supply assemblies to NORMAL (left).

   d. When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.
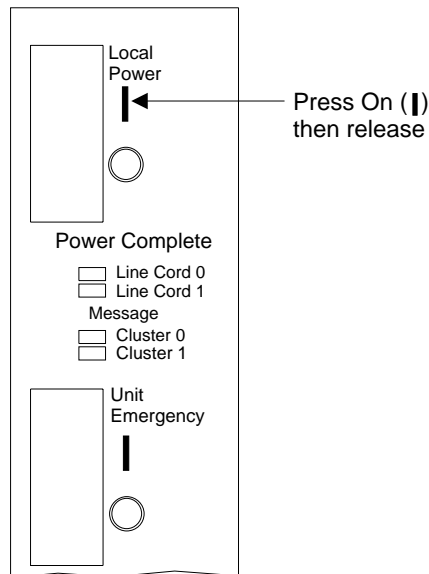
Rack Bulk Power Supply Fan Removal and Replacement

The bulk power supply (P.S.) fan is one FRU. Always replace it as a complete FRU.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not power off the 2105 Model 100 rack when removing the bulk P.S. fan*.

1. Open the front or rear cover of the 2105 Model 100 rack and locate the bulk power supply fan you will be removing:
   - 2105 Model 100 front bulk P.S. fan, front (V3-F1) **1**
   - 2105 Model 100 rear bulk P.S. fan, rear (V4-F1) **2**
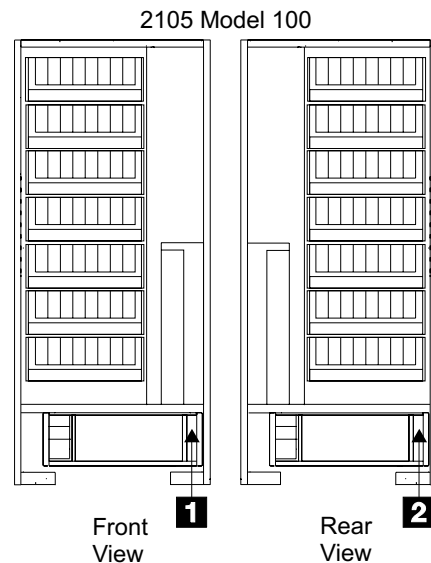
Figure 67. Bulk P.S. Fan Locations (t008979m)

2. Open the front or rear cover of the 2105 Model 100 you are working on.
   - Open the front cover if you are removing the front bulk power fan.
   - Open the rear cover if you are removing the rear bulk power fan.

3. Disconnect the cable from the bulk P.S. fan you are replacing at bulk power supply fan connector J1 **3** .

Bulk Power Supply Fan

4. Loosen the two screws **4** until they are free, then pull the bulk P.S. fan from the BPS assembly.
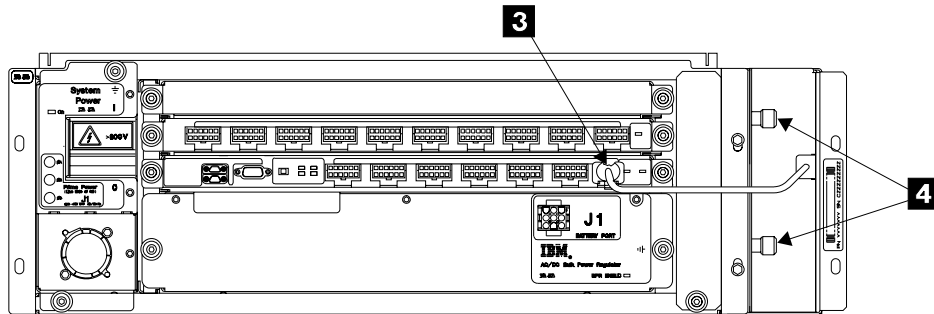
Figure 68. Bulk P.S. Fan Removal (t007123l)

5. Replace parts in the reverse order.

   a. After the replacement, go to the operator panel on the front of the 2105 Model Exx/Fxx that this rack is attached to.

   b. Press the 2105 Model Exx/Fxx Local Power switch to On (|, up) then release it. See Figure 69,

   Note: When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.

Figure 69. 2105 Model Exx/Fxx Operator Panel Switches (t007521m)

Rack 350 V Battery Removal and Replacement

The 350 V battery is one FRU. Always replace it as a complete FRU.

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: Unless you have a particular reason, *do not power off the 2105 Model 100 rack when removing the 350 V battery*.

1. Open the front or rear cover of the 2105 Model 100 rack and locate the 350 V battery you will be removing:

   - 2105 Model 100 350 V battery, front (V7) **1** , go to step 2.
   - 2105 Model 100 350 V battery, rear (V8) **2** , go to step 3 on page 86.

2105 Model 100

Front View

Rear View
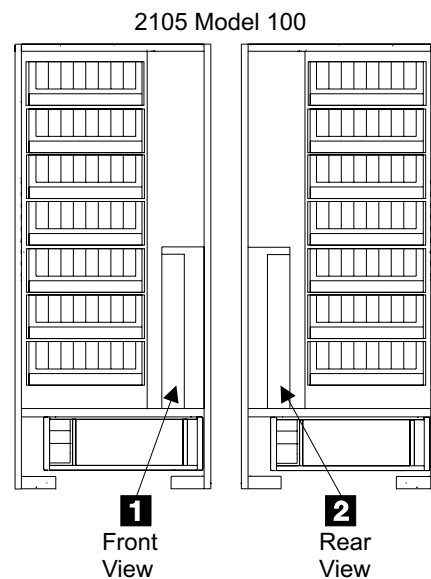
Figure 70. 350 V Battery Locations (t008980m)

2. Do this step only if you are removing the front 350 V battery from a 2105. Do the following steps to remove the front door from the 2105 to allow safe lifting access to the front 350 V battery.

   a. Set the UEPO switch **3** on the front and rear bulk power supply assemblies to BYPASS (right).

      Attention: If the UEPO switch on either bulk power supply is left in the BYPASS position for longer then one hour, a bulk power control (BPC) error will be posted.

350 V Battery
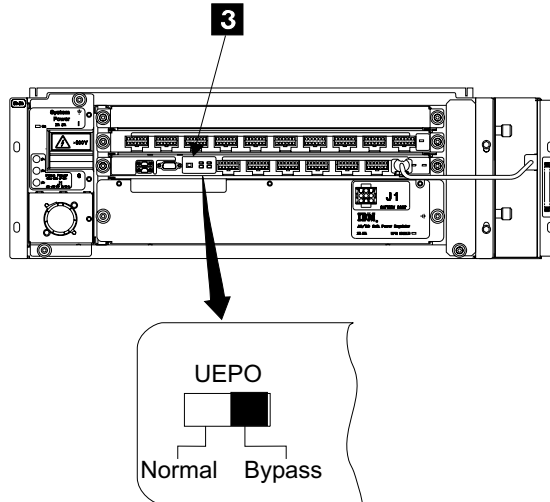
Figure 71. Bulk Power Supply Panel (t007406m)

   b. Release the reusable cable ties inside the front cover to free the operator
      panel cables.

   c. Remove the steel cable restraint from inside the front cover.

      CAUTION:

      **This unit weighs between 18 kg (39.7 pounds) and 32 kg (70.5 pounds).
      Two persons are required to safely move it. Using less than two
      persons to move it can result in injury. (1054)**

   d. Lift the cover off of the rack hinges.

   e. Carefully rotate the cover to the right and lean it against the front of the next
      box or against the side of this box.

   f. Place the battery packing material against the bottom of the door to prevent
      it from falling.

3. On the 350 V battery you are replacing, set the circuit breaker (CB), **7** in
   Figure 73 on page 87, to Off (O, down).

4. Read the following DANGER notice before continuing:

   DANGER

   > **Greater than 300 V dc present on the bulk P.S. to 350 V battery cable
   > connector. To prevent a possible electrical shock, always disconnect
   > this cable at the bulk power supply Battery Power connector before
   > servicing the 350 V battery. (1011)**

   Disconnect the 350 V battery cable from the J1 Battery Power connector **4**,
   on the bulk power supply next to the battery.
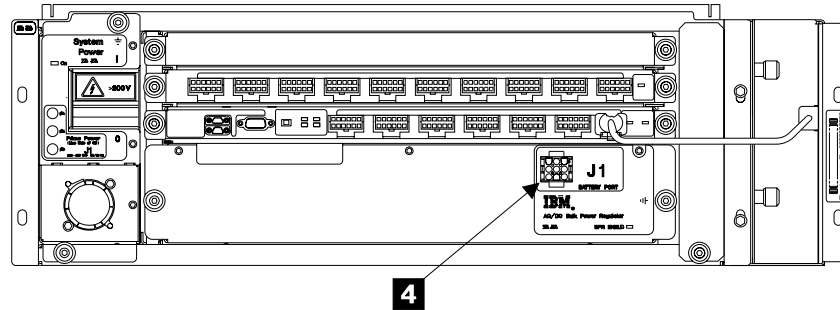
Figure 72. Bulk Power Supply Battery Connector Location (t007422l)

5. Disconnect the cable at 350 V battery connector J1 **6** .

   CAUTION:

   Each of the 390 V batteries in the battery set weighs >45 kg (>100 pounds). Two or more persons are required to safely move it. Using less than two persons to move it can result in injury. (1059)

6. Remove the two screws **5** and **8** pull the 350 V battery out of the rack.

   Note: Front 350 V battery removal only: remove the front door of the 2105 to improve lifting access to the battery. The cables to the operator panel on the door are long enough that they can remain attached with the door removed.
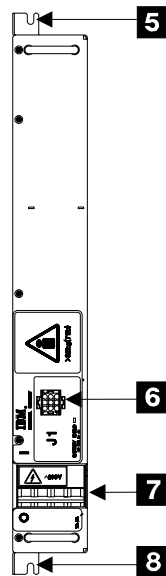
Figure 73. 350 V Battery Removal (t007155m)

7. Dispose of the battery correctly.

   This product contains a SEALED LEAD BATTERY. THE BATTERY MUST BE RECYCLED.

   Attention: The 2105 Model 100 350 V battery assembly contains lead-acid-gel rechargeable batteries. Whenever the 350 V battery assembly is replaced, the used battery assembly must be returned to IBM by following the instructions that are shipped with the new battery assembly.

350 V Battery

8. Replace parts in the reverse order.

Note: Verify that the CB on the new battery is set to Off (O, down) at the start of the replacement and On (|, up) when replacement is completed.

Note: After the repair is complete:

   a. Front battery only, verify the UEPO switch on the 2105 operator panel is set to On (|, up).

   b. Front battery only, after the replacement is complete, set the UEPO switch, **3** in Figure 71 on page 86, on the front and rear bulk power supply assemblies to NORMAL (left).

   c. Go to the operator panel on the front of the 2105 Model Exx/Fxx that this rack is attached to.

   d. Press the 2105 Model Exx/Fxx operator panel Local Power switch to On (|, up) **9** , in Figure 74 then release it.
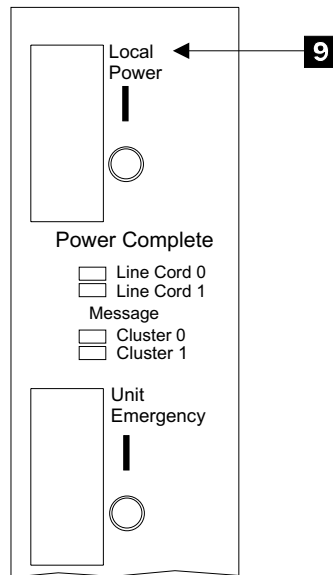
Figure 74. 2105 Model Exx/Fxx Operator Panel Switches (t007598m)

Note: When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.

2105 Model 100 Rack Cable Removals and Replacements

Attention: This is *not* a stand-alone procedure. Perform it *only* at the direction of the service terminal or other service guide procedures. Failure to follow this attention can cause customer operations to be disrupted.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

This procedure removes and replaces the following 2105 Model 100 cables:
- Bulk P.S. Interconnect Cable (Rr-Vv-Jj)
- Bulk P.S. to 350 V Battery Cables (Rr-Vv-Nnn)

- Drawer Power Cables (Rr-Vv-Jj)
- ESS to R2 Input and UEPO P1/P2 (Vv-Jj)
- R2 to R3 Power Output Interconnect Cables bles (Vv-Jj-Aa)
- SSA Device Cables (Rr-Bww-Kk), go to page 70
- Mainline Power Cables (Rr-Vv-Nnn), go to page 78

Note: Unless you have a particular reason, *do not power off the 2105 Model 100 or SSA DASD drawer unless the instructions that you are following tell you to.*

1. Locate the cable you are replacing in Table 8.
2. Open the front or rear cover of the 2105 Model 100 rack and find the cable you are replacing.
3. Disconnect the cable connectors indicated in Table 8 or Table 9 on page 90.

   Attention: When replacing any power cables that attach to the front or rear BPS, observe the following rules:

   - Disconnect the BPS end of the cable first when removing the cable.
   - Attach the BPS end of the cable last when installing the cable.

   Notes:

   a. Carefully note the routing and retention of the cable you are removing, so you can position it correctly during the replacement.
   b. See "Bulk Power Supply (BPS) Component Locations" on page 174 for the location of the BPC and BPD in the BPS.

4. Remove EMC hardware and tailgate cable clamps as required, see "2105 Model 100 Tailgate Cable Clamp Removal and Installation" on page 131.
5. Remove the cable from the 2105.
6. Replace parts in the reverse order.

   Note: When you have completed this procedure, continue the repair by returning to the service guide or service terminal procedure that sent you here.

Table 8. 2105 Model 100 Cable Removal and Replacement

Cable Name	Physical Location Code	Cable Connector Locations and Names		
		Connector 1	**Connector 2**	**Connector 3 (if present)**
Bulk P.S. Interconnect Cable	R1-V3-J9b.1	Front BPS, P9b (BPC)	Rear BPS, P9b (BPC)	
Bulk P.S. to 350 V Battery Cable (front)	R1-V3-N2.1 **Attention:** Read special procedure note 2 on page 92.	Front BPS, J1 (bottom Right)	350 V Battery (front), J1	
Bulk P.S. to 350 V Battery Cable (rear)	R1-V4-N2.1 **Attention:** Read special procedure note 2 on page 92.	Rear BPS, J1 (bottom Right)	350 V Battery (rear), J1	

2105 Model 100 Rack Cables

Table 8. 2105 Model 100 Cable Removal and Replacement (continued)

Cable Name	Physical Location Code	Cable Connector Locations and Names		
		Connector 1	Connector 2	Connector 3 (if present)
Drawer Power Cable (ALL) Go to step 7.	Rr-Vv-Jj			
ESS to R2 input and UEPO P1 Cables (first Model 100 with FC1121)	V3-J8b.1 **Attention:** Read special procedure note 1 on page 91.	Front BPS, J8 (BPC)	Operator Panel, J1	ESS R1 RPC-1 J3
ESS to R2 input and UEPO P2 Cables (first Model 100 with FC1121)	V4-J8b.1 **Attention:** Read special procedure note 1 on page 91.	Rear BPS, J8 (BPC)	Operator Panel, J2	ESS R1 RPC-2 J3
R2 to R3 Power Output Interconnect Cables (second 2105 Model 100 with FC 1122)	V3-J9b-A.1	Front BPS, J9b-A (BPC), second 2105 Model 100	Front BPS, J7 BPD (in first 2105 Model 100)	
R2 to R3 Power Output Interconnect Cables (second 2105 Model 100 with FC 1122)	V4-J9b-A.1	Rear BPS, J9b-A (BPC), second 2105 Model 100	Rear BPS, J7 BPD (in first 2105 Model 100)	
SSA Device Cables (Rr-Bww-Kk), go to page "Drawer SSA Cable Removal and Replacement, Model 020/040 Drawer" on page 70	Rr-Bww-Kk			
Mainline Power Cables (Rr-Vv-Nnn), go to page "Rack Mainline Power Cable Removal and Replacement" on page 78	Rr-Vv-Nnn			

7. Replace drawer power cables using Table 9.
   - 2105 Model 100 racks have drawers 0 to 6, drawer 0 is the lowest mounted drawer in the rack.

Table 9. 2105 Model 100 Drawer Power Cables

From Front or Rear BPS Connector		To Drawer Fan-and-P.S.
BPS (front)	BPS (rear)	
Drawer 5, Drawer Power Cables (three cables):		

Table 9. 2105 Model 100 Drawer Power Cables (continued)

From Front or Rear BPS Connector		To Drawer Fan-and-P.S.
BPS (front)	**BPS (rear)**	
J7b (BPC)		Left Fan-and-P.S.
	J7b (BPC)	Right Fan-and-P.S.
J6t (BPD)	J6t (BPD)	Center Fan-and-P.S.
Drawer 4, Drawer Power Cables (three cables):		
J6b (BPC)		Left Fan-and-P.S.
	J6b (BPC)	Right Fan-and-P.S.
J5t (BPD)	J5t (BPD)	Center Fan-and-P.S.
Drawer 3, Drawer Power Cables (three cables):		
J5b (BPC)		Left Fan-and-P.S.
	J5b (BPC)	Right Fan-and-P.S.
J4t (BPD)	J4t (BPD)	Center Fan-and-P.S.
Drawer 2, Drawer Power Cables (three cables):		
J4b (BPC)		Left Fan-and-P.S.
	J4b (BPC)	Right Fan-and-P.S.
J3t (BPD)	J3t (BPD)	Center Fan-and-P.S.
Drawer 1, Drawer Power Cables (three cables):		
J3b (BPC)		Left Fan-and-P.S.
	J3b (BPC)	Right Fan-and-P.S.
J2t (BPD)	J2t (BPD)	Center Fan-and-P.S.
Drawer 0, Drawer Power Cables (three cables):		
J2b (BPC)		Left Fan-and-P.S.
	J2b (BPC)	Right Fan-and-P.S.
J1t (BPD)	J1t (BPD)	Center Fan-and-P.S.

Notes:

1. Perform this procedure for any UEPO cable replacement:

   a. Set the UEPO switch **1** to BYPASS on the bulk power supply (BPS) associated with the rack power control card (RPC) or BPS cable you are replacing:

      - RPC 0 or front BPS, open the front cover of the 2105 and locate the front bulk power supply **2** .
      - RPC 1 or rear BPS, open the rear cover of the 2105 and locate the rear bulk power supply **3** .

      Attention: If the UEPO switch on either bulk power supply is left in the BYPASS position for longer then one hour, a bulk power control (BPC) error will be posted.
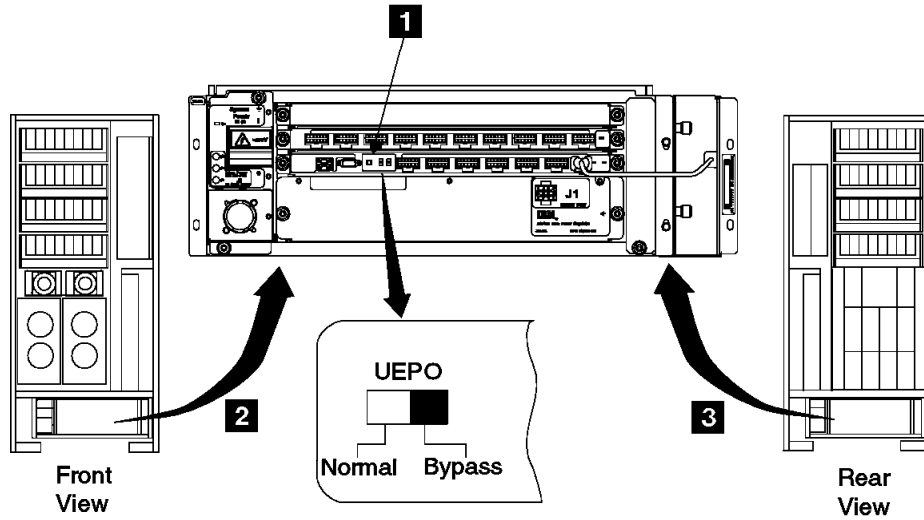
Figure 75. Bulk Power Supply UEPO Switch (t007345m)

    b. After the UEPO cable has been replaced, verify the UEPO switch on the 2105 operator panel is set to On (|, up).

    c. Return the UEPO switch on the bulk power supply to Normal (left).

2. Read the following Danger notice before replacing the bulk P.S. to 350 V battery cable:

DANGER

> **Greater than 300 V dc present on the bulk P.S. to 350 V battery cable connector. To prevent a possible electrical shock, always disconnect this cable at the bulk power supply Battery Power connector before servicing the 350 V battery. (1011)**

Chapter 5. Install and Remove

Attaching the 2105 Model 100 to a 2105 Model Exx/Fxx Unit

These instructions describe:
- Prerequisites to installing FC 1121 and FC 1122.
- What to do before you install (attach) the 2105 Model 100 subsystem.
- How to install the 2105 Model 100 (FC 1121 and FC 1122).
- How to power on the 2105 Model 100s and test the installation.
- How to connect the 2105 Model 100s to the 2105 Model Exx/Fxx subsystem.

Attention: These instructions also assume that all 7133 drawers that are to be physically installed in the 2105 Model 100 have the pre-requisite **compatible** service offering performed. Verify that all existing 7133 drawers have the service offering updating them for installation in an IBM Versatile Storage Server attachment rack. This service offering is the *7133 Model 020 and 040 requirements for 2105 installations* instruction list. The list is in the back of the *IBM Enterprise Storage Server Introduction and Planning Guide* book, form number GC26-7223.

Attention: This installation can not continue unless the Additional 350 V Battery Feature (FC 1000) is installed on the 2105 Model 100s. If the battery feature is not installed, the customer will be exposed to loss of access to all volumes in the 2105 Model 100s.

These instructions assume that you have access to:
- Preinstallation planning and subsystem configuration information from the Configuration Worksheets found in the *IBM Enterprise Storage Server Configuration Planner* book, form number GC26-7353.

Note: Because these instructions describe the SSA DASD Model 020 and 040 drawers, some drawer diagrams may not match the drawers in your 2105.

Before You Install the 2105 Model 100 Racks

This section describes the actions that should be done and safety items that should be considered before you start to install a 2105 Model 100.
- Verify the ship group is complete.
- Check that customer preparation is complete.
- Label and route cables.

Prerequisites to Installing FC 1121 and FC 1122
- The microcode in the ESS subsystem that the 2105 Model 100(s) are attaching to must be at EC F25863 or newer BEFORE beginning this installation procedure.

  Note: To obtain the latest EC information in the US and EMEA, log on to the SuperShipper Website at:
  http://snjlnt02.sanjose.ibm.com/sharkpe/sharkweb.nsf/pages/code.
  For all other locations, contact your next level of support.
- The customer has previously reserved the necessary SSA Loops (FC 9904) in the ESS subsystem to support the 7133 drawers being added. With two FC 9904 (four reserve SSA Loops) you can attach up to a maximum of twelve 7133 Model 020 or 040 drawers.

- The installation must meet both the floor loading and service clearance requirements for installing 2105 Model 100(s) on an ESS subsystem (as specified in ″Site Requirements for the ESS″ in the *IBM Enterprise Storage Server Introduction and Planning Guide* book, form number GC26-7294.

- The customer has filled out the necessary logical configuration information in the Configuration Worksheets for the 7133 device drawers being added to the ESS subsystem (refer to worksheets in the *IBM Enterprise Storage Server Configuration Planner* book, form number GC26-7353.

- The 7133 Model 020 and 040 device drawers being added to the ESS subsystem have:

  – All arrays must be removed using the **Remove Device Drawer** procedure from their previously installed ESS subsystem.

    Note: Failure to properly remove arrays prior to attempting installation in an ESS subsystem will result in the failure of the **Install 7133 Device Drawer** option and require the aid of next level of support.
    Failure to properly remove arrays prior to attempting installation in an ESS subsystem will result in the failure of the **Install 7133 Device Drawer** option and require the aid of the next level of support).

  – All 7133 device drawers must be checked for compatibility before being added to an ESS subsystem. Use the **7133 Model 020 and 040 Requirements for 2105 Installations** service offering instructions provided in the *IBM Enterprise Storage Server Introduction and Planning Guide* book, form number GC26-7294.

  – All 7133 device drawers must meet the following additional compatibility requirements:

    1. Only 7133 Model 020 and 040 device drawers can be attached to an ESS subsystem.

    2. Only six 7133 device drawers can be installed in a 2105 Model 100 rack, twelve in two 2105 Model 100 racks.

    3. Dummy DDMs or open slots are not allowed (DDMs must be installed in all 16 DDM slots).

    4. 7133 Model 020 and 040 device drawers can not be intermixed on the same SSA Loop.

    5. All 7133 device drawers have their front covers and DDM locks removed.

Verify the Ship Group is Complete

Place a check mark next to each completed step.

__ 1. Remove the CE Unpacking Instructions from the CE envelope taped to the front of the bagged 2105 Model 100. These instructions may be in document enclosure of previously installed racks. Use the CE Unpacking Instructions to unpack the 2105 Model 100 and prepare it for installation.

__ 2. Perform the safety inspection if the 2105 Model 100 was previously installed and was not previously leased from IBM or maintained by IBM service representatives. See "Chapter 12. Safety Check" on page 203 to perform this inspection.

__ 3. Verify that all items listed in the ship group were received.

    Note: Feature Codes (FC) 1121 and 1122 supply all of the SSA cables required for six 7133 drawers in each 2105 Model 100 rack. Save the unused cables for future 7133 drawer installations.

__ 4. Place the ship group parts list at the end of this manual for future use.

__ 5. Inspect the 2105 Model 100 for any damage that might have occurred during shipping.

If you observe shipping damage or missing items, do not install the 2105 Model 100 without IBM management approval. Report all observed damage immediately, following existing procedures.

__ 6. Continue with "LIC Feature Control Record Extraction".

LIC Feature Control Record Extraction

Check if a diskette containing LIC Feature Control Records was supplied in the FC 1121 or FC 1122 ship group or a MES.

• If a LIC Feature Control Record diskette WAS supplied, this procedure is not necessary. Continue with "Checking the Customer Preparation" on page 97.

• If a LIC Feature Control Record diskette WAS NOT supplied, you (the service support representative) will have to determine if LIC features have been ordered for this machine. Do the following procedure to determine if LIC features have or have not been ordered. If LIC features have been ordered, this procedure will guide you to make a LIC Feature Control diskette.

Note: The LIC Feature Control Records diskette will be used later during installation configuration.

Requirements:

• PC with Web browser and diskette drive

• DOS formatted 1.44 MB, 3.5 inch diskette

  Attention: The ESS diskette drive only reads 1.44 formatted diskettes formatted by a 1.44 drive.

Procedure: Place a check mark next to each completed step.

__ 1. Bring up IBM ViewBlue with the following URL:

  http://w3.viewblue.ibm.com

__ 2. At the IBM ViewBlue Information and Services Logon screen, do the following.

  a. Select your Country

  b. Enter your IBM employee Serial Number.

  c. Click the **Logon** box

__ 3. If you get an informational screen, click on **Continue**.

__ 4. At the IBM Public Information and Services Main Menu, do the following.

  a. Scroll down to **Technical**

  b. Click **FCDB** - Feature Code Database

__ 5. At the Feature Code Database - Main Menu screen, click on **Extract Machine Data**.

__ 6. At the Feature Code Database - Select Machine screen, do the following:

  a. Select your Machine Type/Model

  b. Enter the two character Plant of Manufacture Code

    1) 13 = San Jose, USA

    2) 75 = Vac, Hungary

    3) 82 = Sumare, Brazil

    4) 97 = Fujisawa, Japan

  c. Enter the five character Machine Serial Number

  d. Click the **Submit** box

If a file name of **FEA#####.BIN** is displayed, a LIC Feature Control diskette is required.

Was file name **FEA#####.BIN** displayed?

- **Yes**, go to step 7.
- **No**, continue with "Checking the Customer Preparation".

__ 7. At the Feature Code Database - Download Control File screen, do the following:

 a. Click on the Download Filename displayed in the format of **FEA#####.BIN**

 b. At the Save as... pop up screen, do the following

 1) At the Save In folder, select **3.5 inch Floppy (A:)**

 2) Click the **Save** box

__ 8. The file is now saved on the 3.5 inch DOS diskette. Close all browser windows.

__ 9. Label the Diskette and save it for later use with Installation Configuration.

__ 10. Continue with "Checking the Customer Preparation".

Checking the Customer Preparation

__ 1. Ensure the customer has two ac power supply cables for each 2105 Model 100 from two separate power sources for maximum fault tolerance.

 Notes:

 a. Operation with a single mainline power cable is not supported at installation.

 b. The IBM 2105 Model 100 are designed for connection to an IT power distribution system. An IT power distribution system is one where the neutral conductor *is isolated* from earth (ground) by an impedance with exposed conductive parts in the installation tied directly to earth. No service representative action is needed, information is for compliance with international Electrotechnical Commission standard 950 for the safety of information technology equipment, and electrical business equipment.

__ 2. If the 2105 Model 100s will be installed on a raised floor, ensure the customer has correct airflow for cooling.

 Note: The 2105 Model 100s rack cooling airflow comes in through the front cover and leaves through the rear cover. The bottom of the 2105 Model 100 is sealed.

 To correctly cool a 2105 Model 100s, place two floor tiles that have holes for airflow, directly in front of the 2105 Model 100s.

__ 3. The temperature operating environment requirements for 2105 are found in the *IBM Enterprise Storage Server Introduction and Planning Guide* book.

__ 4. Continue with "How to Install the 2105 Model 100 Racks".

How to Install the 2105 Model 100 Racks

This section describes positioning the 2105 Model 100 racks and preparation for customer power checks.

- Position the 2105 Model 100s for installation.
- Lock casters and remove drawer shipping brackets.

Attaching the 2105 Model 100

> **Note:** 2105 Model 100 racks can be installed non-disruptively.

Position the 2105 Model 100 Racks

If you have any questions about floor loading and service clearances of the ESS racks, review the *Site Requirements for the ESS* section in the *IBM Enterprise Storage Server Introduction and Planning Guide* book, form number GC26-7294.

CAUTION:

A fully configured unit in the crate can weigh up to 1500 kilograms (3305 pounds). Using less than three persons to move it can result in injury. (1060)

> **Note:** This notice is translated into selected languages. See ″Translation of Cautions and Danger Notices″ in chapter 11 of the *Enterprise Storage Server Service Guide, Volume 3*.

___ 1. Ensure that the new location meets the necessary service clearances and floor loading for the 2105 ESS subsystem and any attached racks, refer to **Site Requirements** in the *IBM Enterprise Storage Server Introduction and Planning Guide* book, form number GC26-7294.

___ 2. On raised floors, position the floor tiles with holes for cable entry to the front of the 2105 Model 100, as shown in the *IBM Enterprise Storage Server Introduction and Planning Guide* book.

   Attention: The weight of the 2105 Model 100 can be as high as 1204 kilograms (2650 pounds) per rack. The weight of this rack should be reviewed with the customer to ensure that their raised floors have adequate support.

___ 3. Position the 2105 Model 100 on the right side of the 2105 ESS subsystem. See Figure 76 on page 99. Move the 2105 Model 100 racks to their permanent locations with the cutout floor tiles beneath the front and rear tailgate area.

2105 Subsystem (front View)

Rack 1 (R1-   )   Rack 2 (R2-   )   Rack 3 (R3-   )

2105 Model Exx/Fxx   2105 Model 100   2105 Model 100
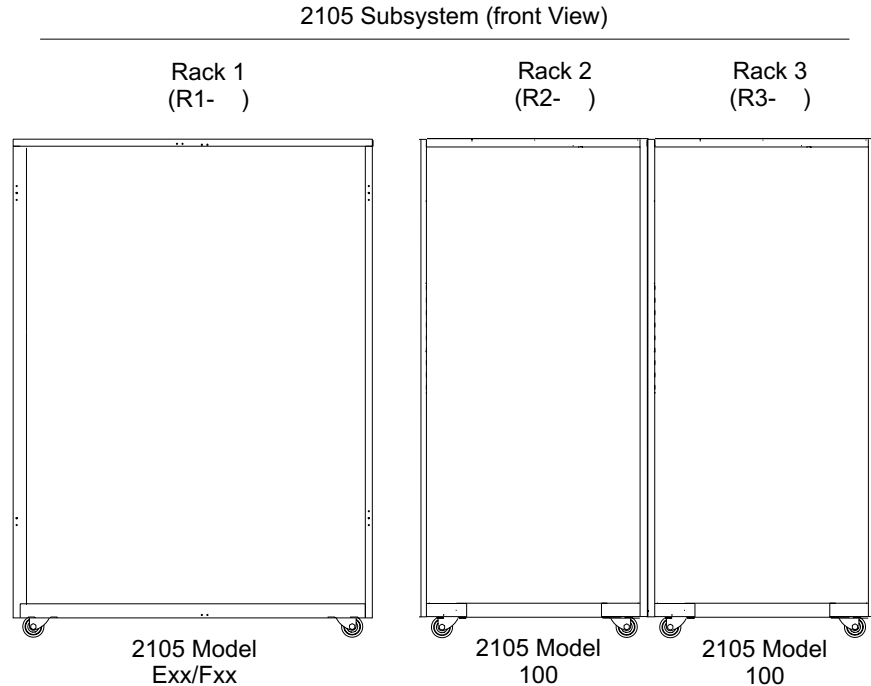
Figure 76. Suggested 2105 Rack Positions for 2105 Model 100s (s008856n)

__ 4. Install the rack spacer onto the side of the second 2105 Model 100 **5** that will be against the first 2105 Model 100.

a. Hang the rack spacer **3** onto the side of the second 2105 Model 100 and install the two screws **4** into the top of spacer. Do not tighten the screws.

b. Position the second 2105 Model 100 against the first 2105 Model 100 **1** .

c. Install the two screws **2** into the first 2105 Model 100 side of the rack spacer. Do not tighten the screws.

__ 5. Install the two front bolts and washers **6** and two rear bolts and washers, not shown, that fasten the two2105 Model 100s together . Insert the bolts from the second 2105 Model 100 box side and screw them into the captured nuts in the first 2105 Model 100. Tighten the bolts evenly. Installation of right 2105 Model 100 shown.

Note: The bolts and washers are in the 2105 Model 100 ship group.

__ 6. Tighten the four screws **2** and **4** that hold the rack spacer **3** to the 2105 frames.

Attaching the 2105 Model 100

Front View
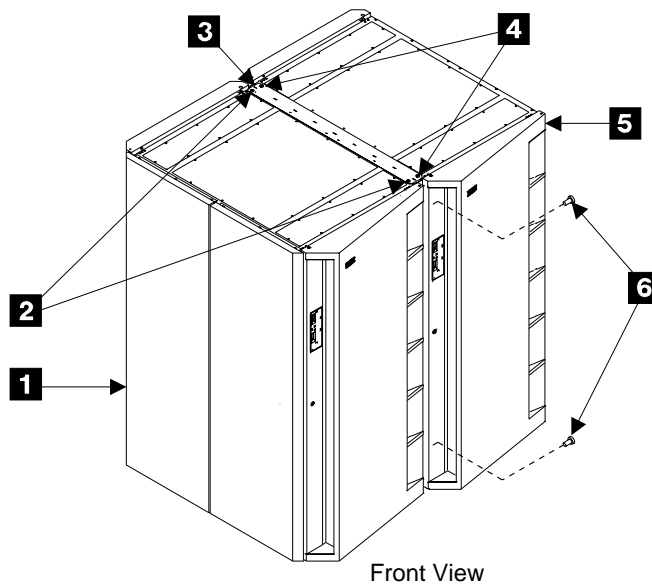
Figure 77. 2105 Rack and Spacer Installation (t007362m)

__ 7. Go to the rear of the second 2105 Model 100 and locate the frame ground strap **8** .

Note: If the ground strap is not on the side of the frame next to the 2105 Model 100, move it to the same position on the other side of the 2105 Model 100 frame **7** .

   a. Loosen the top ground strap mounting screw and remove the bottom screw and star washer.

   b. Feed the loose end of the ground strap inside the frame to the first 2105 Model 100 **9** .

   c. Fasten the ground strap terminal to the same position in the first 2105 Model 100 **9** . Verify that the star washers are between both cable terminals and the frames.

   d. Tighten both ground strap screws.
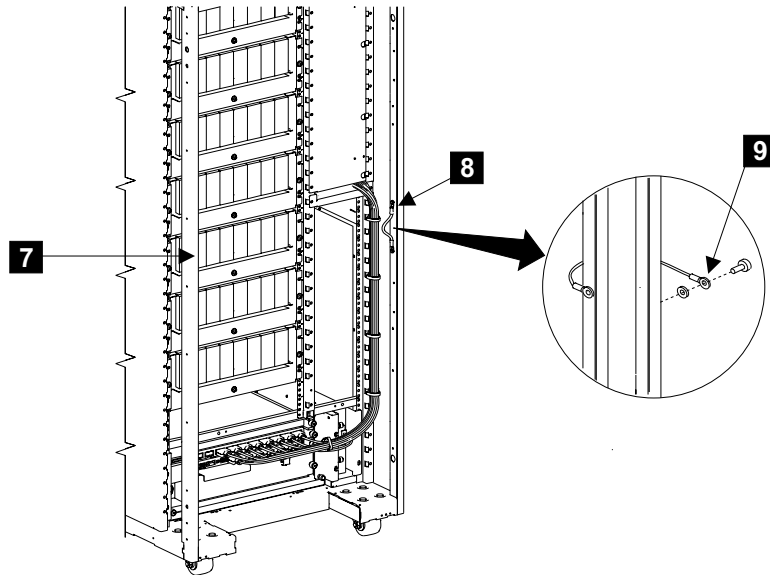
Figure 78. 2105 Model 100 Ground Strap Location (t007478m)

__ 8. Install the wedge locks **10** (located in the ship group) on all four casters.
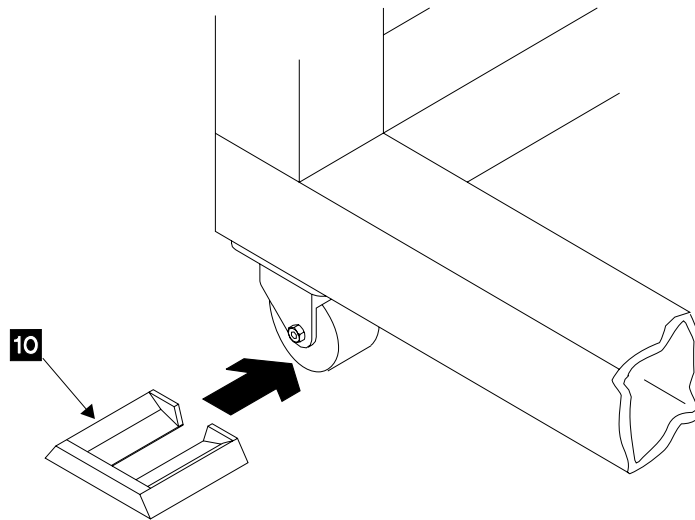
Figure 79. Caster Wedge Locks (t007095m)

__ 9. If installed, remove the orange drawer shipping brackets from the rear of all SSA DASD Model 020 drawers.

    a. Disconnect the power cables **14** from the two outside fan-and-power supplies.

    b. Remove the two screws **11** and **13** from each orange drawer shipping bracket **12** .

    c. Remove the brackets from the rear of each SSA DASD drawer.

    d. Reinstall the two screws back into the frame **11** and **13** .

    e. Place the shipping brackets inside the 2105 shipping container for return to IBM.

Attaching the 2105 Model 100

Note: The shipping bracket is not used with SSA DASD Model 040 drawers.

Rear
View
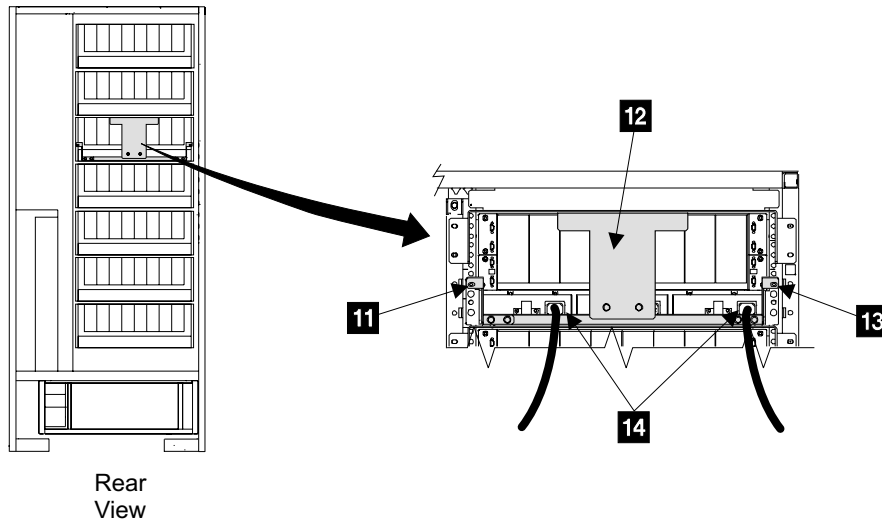
Figure 80. SSA DASD Drawer Shipping Brackets (t007094m)

__ 10. When all 2105 racks have been logically installed, use the Rack
Identification Labels (P/N 34L8708 from the ship group) to identify each
rack, including the 2105 Model Exx/Fxx as R1. Open the front covers of
each frame, place the appropriate label on the center of the front top frame
member of each rack.
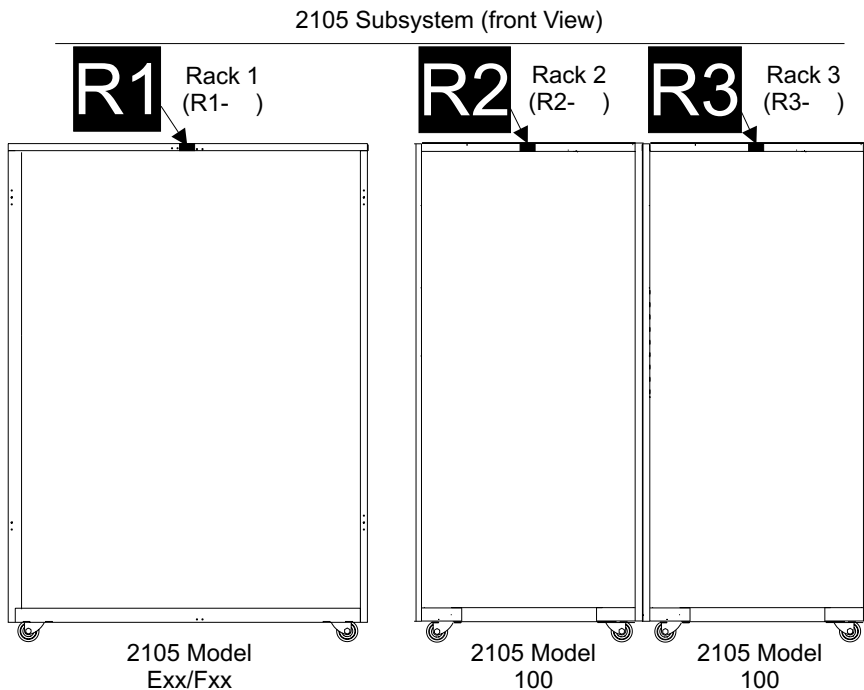
Figure 81. Rack Identification of Attaching 2105 Model 100s (S008857n)

__ 11. Unroll the mainline power cables from the front and rear of each 2105 rack.

__ 12. Check that the cables to the bulk power supplies did not come loose during shipment. Verify that all cables to the front and rear bulk power supplies **15** and **16** are connected and seated properly.
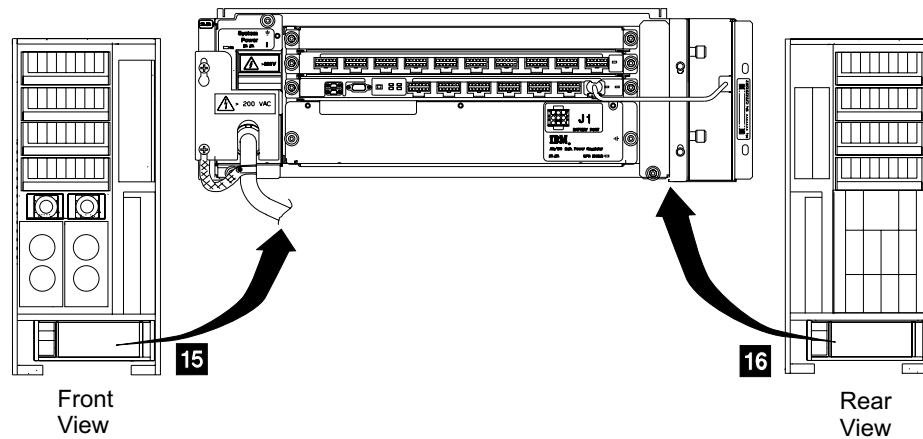
Figure 82. Bulk Power Supply Cables (t007614m)

__ 13. Feed the mainline power cables, for each 2105 rack, down through the right side of the front and rear tailgates **19** to the customers power connectors.

CAUTION:

Do not connect the mainline power cables until instructed to do so. (1053)

- **Raised floor installations**, route the mainline power cables under the floor and set them next to the customers power connectors.
- **Non-raised floor installations** route the front mainline power cables to the rear of the 2105. Then route both mainline power cables and set them next to the customers power connectors.

If there is not enough clearance to route the mainline power cable connector through the tailgate:

a. Remove the four tailgate mounting screws **17** and **18**.

b. Remove the tailgate assembly **20** from the 2105.

c. Feed the mainline power cable connector **19** through the free tailgate **20**.

d. Route the mainline power cable to the rear of the 2105 or under the floor.

e. Install the tailgate assembly **20** into the 2105 then install the four mounting screws **17** and **18**.
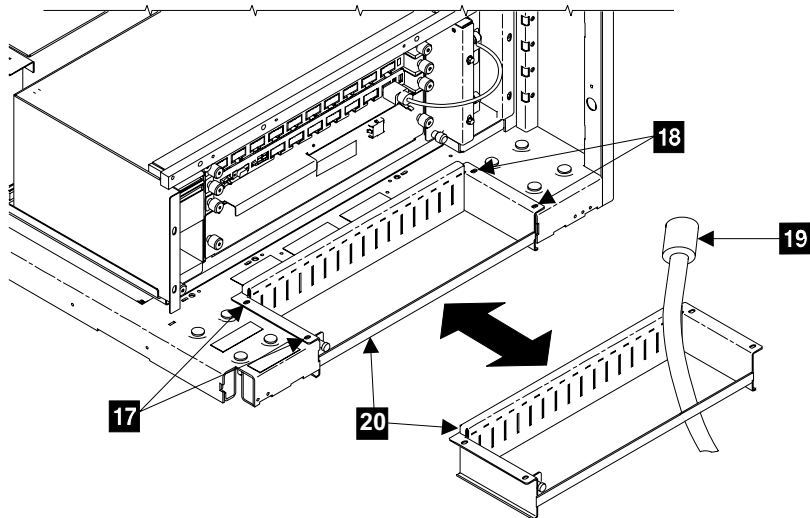
Figure 83. 2105 Tailgate Removal (t007615m)

__ 14.   Continue with "Checking the Customers Power".

Checking the Customers Power

DANGER

Lethal voltages are present in this area of the machine. (1007)

This section describes the power and safety checks that must be done before you power on the 2105 subsystem.
* Conduct safety power checks.
* Complete AC input power checks.

The fault-tolerant system on the 2105 Model 100 has two power systems. If one power system fails, the other will supply all required power. You will perform power checks, cabling, and preparation on both power systems.

Always perform power safety checks with the recommended analog meter. Do not use a digital meter when you perform power checks. A digital meter is sensitive to external electrical currents on the low-range scale.

You will need these tools to perform the power safety checks:
* Analog multimeter (P/N 9900167) or a substitute meter approved by IBM for this check.
* High voltage test probe tips (or equivalent):
     Red (P/N 1749249)
     Black (P/N 1749250)

Check the Ground Continuity
Attention: Use an IBM-approved analog multimeter. Do not use a digital meter.

Attention: Each 2105 Model 100 has two mainline power cables. Complete all steps of this section for *both* power sources and receptacles and for *both* power plugs, mainline power cables, and bulk power supplies (BPS) on **each** 2105 rack.

__ 1. **CAUTION:**

   Do not connect the mainline power cables until instructed to do so. (1053)
   Switch off each customer circuit breaker that supplies AC voltage to the mainline power cables.

__ 2. Attach a "Do Not Operate" tag (S229-0237) and the safety lockout padlock to each customer circuit breaker. Refer to the *Electrical Safety for IBM Customer Engineers* book.

__ 3. Ensure the System Power ac circuit breaker (CB) **1** on the front and rear bulk power supplies is set to Off (O, down).

__ 4. Connect each mainline power cable to the inlet **4** on each bulk power supply.

__ 5. Verify that the ground strap **3** on each mainline power cable is held under the mainline power cable retention plate by the lower mounting screw **2** .
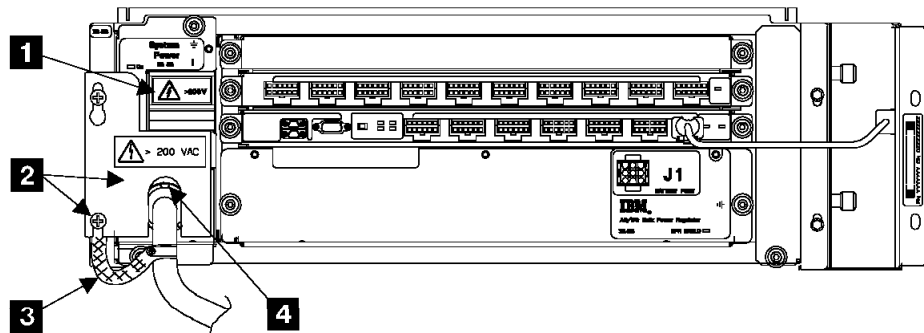
Figure 84. Bulk Power Supply Mainline Circuit Breaker (t007109l)

__ 6. Locate the customer end of the mainline power cables.

   Determine if the customer end of the mainline power cables are for plug in or wired installations:

   • **Plug In:** The cable has a plug at both ends.

   • **Wired:** The cable has a plug at one end and bare wires at the other end.

__ 7. Prepare the multimeter to measure 0.1 ohm or less resistance. For connector information, refer to figure Figure 85 on page 106.

   • **For the mainline power cable (plug in):** Place one lead of the multimeter on each ground pin of the male plug on the mainline power cable. Place the other lead on the bare metal of each bulk power supply enclosure.

     – If there is 0.1 ohm or less resistance, go to step 11 on page 106.

     – If there is more than 0.1 ohm resistance, go to "Repair the Ground Continuity" on page 106.

Ground   Ground

Single-Phase 50 amp   Three-Phase 50 amp   Three-Phase 60 amp
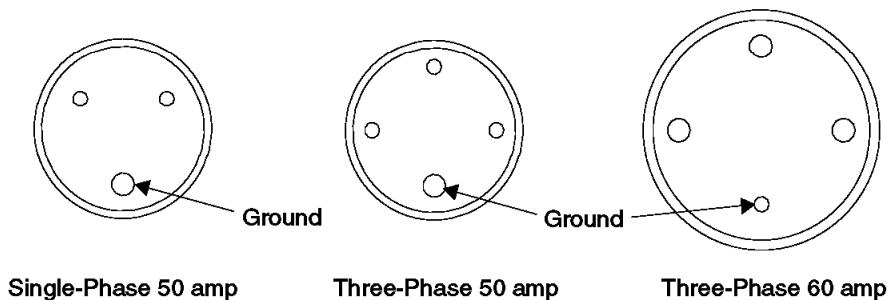
Figure 85. Male Plug on the Mainline Power Cable (t007096l)

- ***For the mainline power cable (wired):*** Place one lead of the multimeter on the green and yellow wire the customer end of each mainline power cable. Place the other lead on the bare metal of each bulk power supply enclosure.
    - If there is 0.1 ohm or less resistance, continue with step 8.
    - there is more than 0.1 ohm resistance, go to "Repair the Ground Continuity".

__ 8. On wired machines only, remove and save the front and rear mainline power cable retention plates.

  a. Loosen the top screw **5** and remove the bottom screw **6** on each BPS.

  b. Remove the front and rear mainline power cable retention plates **9** .

  c. Free the ground strap **7** .

  d. Reinstall and tighten both screws after removing the plates and ground straps.

__ 9. Disconnect each wired mainline power cable **8** from the inlet on the bulk power supply.
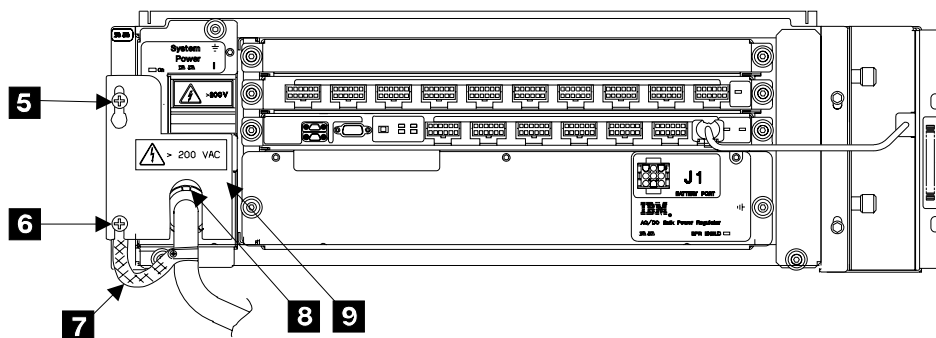
Figure 86. Bulk Power Supply (t007510l)

__ 10. Instruct the customer to call a licensed electrician to connect each wired mainline power cable to the customer mainline power source.

__ 11. Continue with "Check the Customer's Circuit Breaker with the Power Off" on page 108.

Repair the Ground Continuity

If the previous procedure measured more than 0.1 ohm resistance between the ground pin of the mainline power cable and the bulk power supply enclosure. Follow these steps to check the ground continuity.

__ 1. Remove and save the power cable retention plate for the problem mainline power cable.

    a. Loosen the top screw **1** and remove the bottom screw **2** on the BPS.

    b. Remove the mainline power cable retention plate **5** .

    c. Free the ground strap **3** .

    d. Reinstall and tighten both screws after removing the plate and ground strap.

__ 2. Disconnect the problem mainline power cable **4** from the inlet on the bulk power supply.
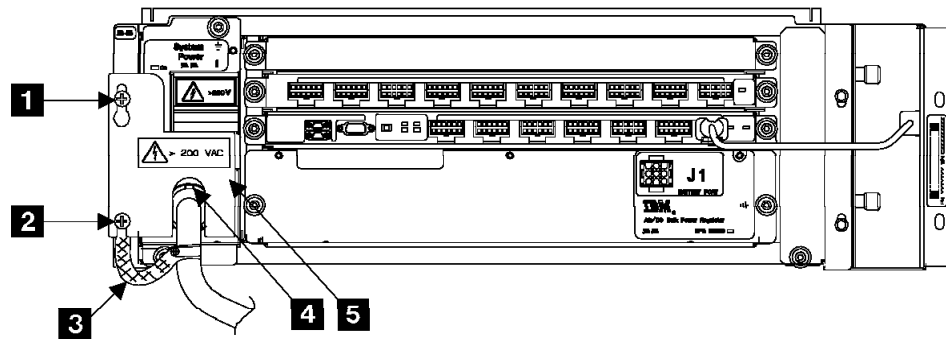
Figure 87. Bulk Power Supply (t007440l)

__ 3. Prepare the multimeter to measure 0.1 ohm or less resistance. For connector information, refer to figure Figure 88.

    • ***For the mainline power cable (plug in):*** Place one lead of the multimeter on the ground pin of the male plug on the mainline power cable.

    • ***For the mainline power cable (wired):*** Place one lead of the multimeter on the green and yellow wire at the customer end of the mainline power cable.

__ 4. Place the other lead on the ground pin of the female connector on the mainline power cable.
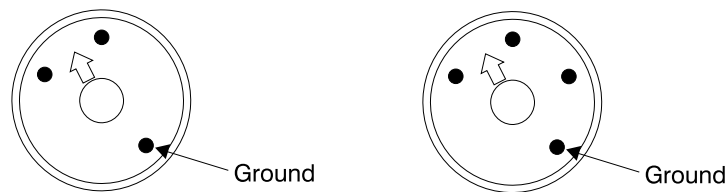
Single-Phase 50 amp   Three-Phase 50/60 amp

Figure 88. Female Connector on the Mainline Power Cable (Three-Phase, 4-Prong) (50070971)

    • If there is 0.1 ohm or less resistance, the cable is good but the bulk power supply enclosure is not grounded. Perform steps 8 on page 108 through 10 on page 108.

       • If there is more than 0.1 ohm resistance, the mainline power cable ground lead is open or has resistance. Perform steps 5 through 7.

__ 5. If the ground lead on the bulk power supply is open or has resistance, replace the mainline power cable. Go to "Rack Mainline Power Cable Removal and Replacement" on page 78, and then return here to continue.

__ 6. Insert the female connector on the new mainline power cable into the inlet on the bulk power supply.

__ 7. Return to step 7 on page 105 to verify that ground continuity now measures 0.1 ohm or less resistance on the replaced cable.

__ 8. If the bulk power supply enclosure is not grounded, replace the bulk power supply. Go to "2105 Model 100 Rack Bulk Power Supply Removals and Replacements" on page 73, and then return here to continue.

__ 9. Insert the female connector on the mainline power cable into the inlet on the bulk power supply.

__ 10. Return to step 7 on page 105 to verify that ground continuity now measures 0.1 ohm or less resistance.

Check the Customer's Circuit Breaker with the Power Off

This procedure verifies that *both* customer outlet receptacles for each rack are grounded correctly and that there is no voltage present at either outlet when *both* outlet circuit breakers are off.

__ 1. Prepare the multimeter to measure 1.0 V ac or less. For connector information, refer to Figure 89 and Figure 90 on page 109.

    DANGER

> **Do not touch the pins of either mainline power cable plugs with anything except high voltage probes until you complete this step. (1004)**

    • ***For the mainline power cable (plug in):*** Measure the voltage at the customers ac power outlet between the ground pin and the building ground.

    • ***For the mainline power cable (wired):*** Measure the voltage between the female ground pin on each mainline power cable and the building ground.

Single-Phase 50 amp
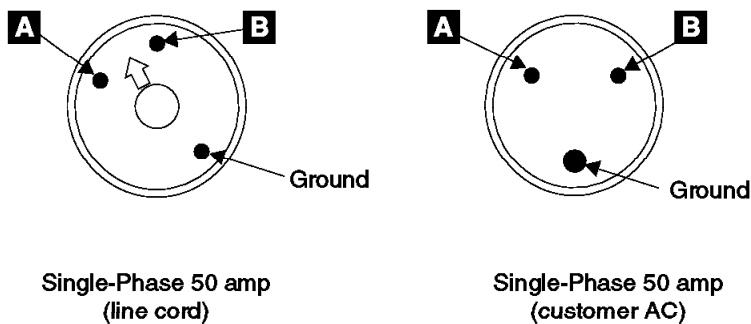(line cord)

Single-Phase 50 amp
(customer AC)
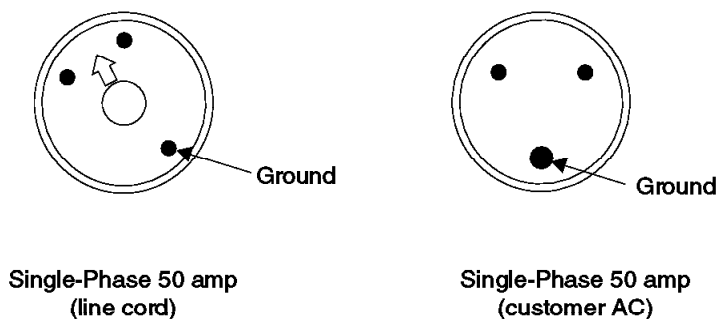
Figure 89. Single Phase Female Connector on the Mainline Power Cable (5007098l)
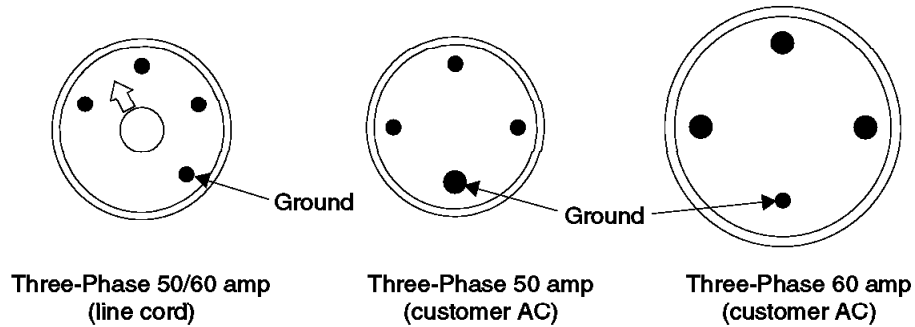
Figure 90. Three Phase Female Connector on the Mainline Power Cable (t007099l)

- – If the measured voltage is less than 1.0 V ac, go to step 3.
- – If the measured voltage is 1.0 V ac or greater, continue with step 2.

__ 2. Voltage is present at a customer outlet with both outlet circuit breakers off.

DANGER

> **Inform the customer that, even though the circuit breaker is off, voltage higher than 1.0 V ac is measured at the failing customer voltage outlet pins.**
>
> **Do not continue until the voltage is less than 1.0 V ac. (1003)**

- *For the mainline power cable (plug in):* Inform the customer that voltage higher than 1.0 V ac is measured at the ground pin of the failing customer voltage outlet.

  Do not continue until the voltage is less than 1.0 V ac.

- *For the mainline power cable (wired):* Inform the customer that voltage higher than 1.0 V ac is measured at the ground pin of the failing wired ac mainline power cable.

  Do not continue until the voltage is less than 1.0 V ac.

__ 3. Prepare the multimeter to measure 0.1 ohm or less of resistance.

- *For the mainline power cable (plug in):* Measure the resistance between the customer ac power outlet ground pin on each mainline power cable and the building ground. A reading of 0.1 ohm or less shows a safe, continuous grounding conductor.

- *For the mainline power cable (wired):* Measure the resistance between the female connector ground pin and the building ground. A reading of 0.1 ohm or less shows a safe, continuous grounding conductor.

  - – If the measured resistance at the ground pin is 0.1 ohm or less, continue with "Check the Single- or Three-Phase ac Power Cable or Outlet".

  - – If the measured resistance is more than 0.1 ohm on the connector, inform the customer. Do not continue until the resistance is 0.1 ohm or less.

Check the Single- or Three-Phase ac Power Cable or Outlet

__ 1. Prepare the multimeter to measure 1.0 V ac or less.

- *For the mainline power cable (plug in):* Measure ac voltages at the customers ac power outlet (female).

Attaching the 2105 Model 100

     – For single-phase AC see Table 10 and Figure 91.

     – For three-phase AC see Table 11 and Figure 92 on page 111.

   • **_For the mainline power cable (wired):_** Measure ac voltages at the female connector on each mainline power cable. See Table 11 and Figure 91.

Table 10. Measuring Points for Single Phase ac Voltages

Phase-to-phase	Phase-to-ground
V ac between **A** and **B**	V ac between **A** and ground
	V ac between **B** and ground

Table 11. Measuring Points for Three Phase ac Voltages

Phase-to-phase	Phase-to-ground
V ac between **A** and **B**	V ac between **A** and ground
V ac between **B** and **C**	V ac between **B** and ground
V ac between **A** and **C**	V ac between **C** and ground

    – If all measured voltages (phase-to-phase and phase-to-ground) at the voltage pins on the female connector or at the customers ac power outlet (female) are less than 1.0 V ac, continue with "Check the Customer's Circuit Breaker with the Power On" on page 111.

    – If any measured voltage is 1.0 V ac or greater, inform the customer that, even though the circuit breaker is off, voltage higher than 1.0 V ac is measured at the failing wired ac mainline power cable voltage pins or the failing customer voltage outlet pins.

    Do not continue until the voltage is less than 1.0 V ac.

Single-Phase 50 amp (line cord)

Single-Phase 50 amp (customer AC)

Figure 91. Single Phase Female Connector on the Mainline Power Cable (5007100l)

Three-Phase 50/60 amp
(line cord)

Three-Phase 50 amp
(customer AC)

Three-Phase 60 amp
(customer AC)
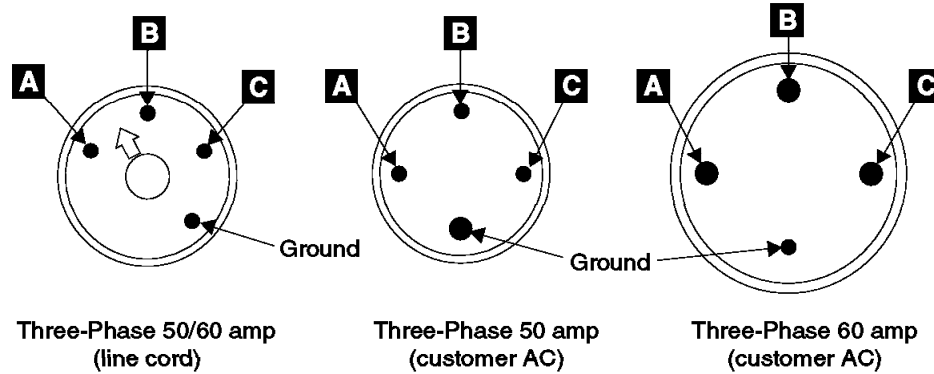
Figure 92. Three Phase Female Connector on the Mainline Power Cable (t007101l)

__ 2. Continue with "Check the Customer's Circuit Breaker with the Power On" .

Check the Customer's Circuit Breaker with the Power On
This procedure verifies that *both* customer outlet receptacles are grounded correctly and that the correct voltages are present at *both* outlets when the outlet circuit breakers are on.

Always perform power checks with the recommended analog meter. Do not use a digital meter.

__ 1. Remove the "Do Not Operate" tag and the lockout padlock from each customer mainline ac voltage circuit breaker.

__ 2. Switch on each customer circuit breaker to supply mainline ac voltage to each 2105 Model 100.

   • For ***plug*** in mainline power cables, go to go to step 4.

   • For ***wired*** mainline power cables, go to step 3.

__ 3. Prepare the multimeter to read line voltage AC. For connector information, refer to figure Figure 93 on page 112.

   DANGER

   > **Dangerous voltages may be present. Do not touch the internal parts (pins and connectors) of the mainline power cable plugs. (1006)**

   For the mainline power cable (wired): Measure the ac voltage at the voltage pins of each female connector on both mainline power cables when both customer circuit breakers are on for each rack.

   Record the measured ac voltages in step 5 on page 112 then continue from there.

__ 4. Prepare the multimeter to read line voltage AC. For connector information, refer to figures Figure 93 on page 112 and Figure 94 on page 112.

Attaching the 2105 Model 100

DANGER

Dangerous voltages may be present. Do not touch the internal parts (pins and connectors) of either customer voltage outlet. (1005)

For the mainline power cable (plug in): Measure the ac voltage at the voltage pins of each customers ac power outlet when both customer circuit breakers are on for each rack.

Record the measured ac voltages in step 5 then continue from there.
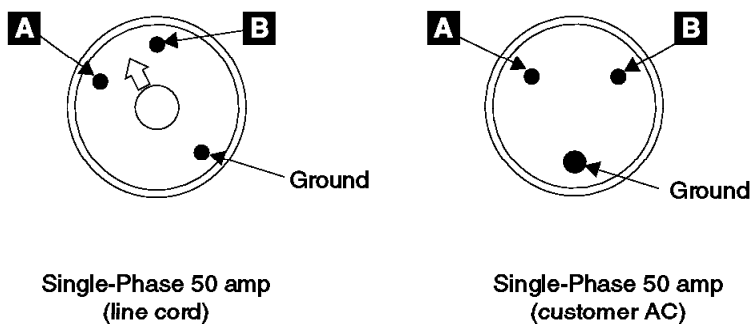
Figure 93. Single Phase Female Connector on the Mainline Power Cable (5007100l)
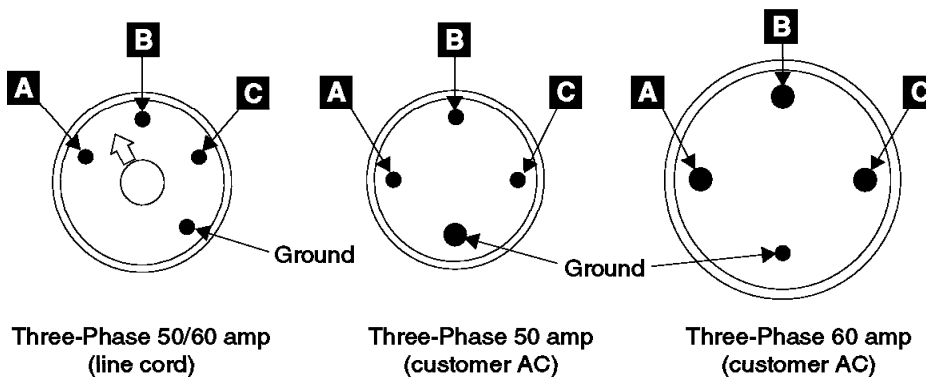
Figure 94. Three Phase Female Connector on the Mainline Power Cable (t007101l)

__ 5. Record the voltages measured:
   - For single-phase voltage, record the voltages in Table 12.
   - For three-phase voltage, record the voltages in Table 13 on page 113.

Table 12. Single-Phase ac Line Voltages

Measure the ac Voltages	Power Outlet Voltage Connector 0 (BPS-0)	Power Outlet Voltage Connector 1 (BPS-1)
Between **A** and **B**		

Table 13. Three-Phase ac Line Voltages

Measure the ac Voltages	Power Outlet Voltage Connector 0 (BPS-0)	Power Outlet Voltage Connector 1 (BPS-1)
Between **A** and **B**		
Between **B** and **C**		
Between **A** and **C**		

__ 6. Continue with 7.

__ 7. Verify AC input voltages from Table 12 on page 112 or Table 13 are correct:

  • **Single Phase**: Are both input voltages between 200 V ac and 480 V ac?

    – **Yes, continue with step 8**.

    – **No, inform the customer if the voltage is outside this range**.

  • **Three Phase**: Are all input voltages between 200 V ac and 480 V ac and within 10% on each connector?

    – **Yes, continue with step 8**.

    – **No, inform the customer if any voltage is not within range**.

__ 8. Switch off each customer circuit breaker that supplies AC voltage to the mainline power cables.

__ 9. Attach a "Do Not Operate" tag (S229-0237) and the safety lockout padlock to each customer circuit breaker. Refer to the *Electrical Safety for IBM Customer Engineers* book.

__ 10. Connect the mainline power cables for **each** rack being installed:

  Note: Determine if the customer will be providing an UPS (uninterruptable power system) and how many UPS connections (one or two) will be available for this frame:

    • *If only one UPS connection is available for this frame,* ensure the UPS is connected to mainline power cable 0. The 350 V batteries are charged by the bulk power supply attached to mainline power cable 0.

    • *If two UPS connections are available for this frame,* connect each UPS to a mainline power cable (0 or 1).

  • ***For the mainline power cable (plug in):*** Connect each plug in mainline power cable to each customer ac power outlet.

  • ***For the mainline power cable (wired):*** Connect each wired mainline power cable **4** to each bulk power supply.

__ 11. Read the following Danger notice before continuing.

  DANGER

  > **Customers can be exposed to lethal AC voltages if the mainline power cable retention plates are not installed. The front and rear mainline power cable retention plates must be installed before the machine is returned to the customer. (1010)**

  Verify that the front and rear mainline power cable retention plates and ground straps are installed:

  a. Loosen two screws on each BPS **1** and **2**.

  b. Verify that the lower screw has the mainline power cable ground strap **3** under it.

c. Install the front and rear mainline power cable retention plates **5** .

d. Tighten the screws after installing the plates.
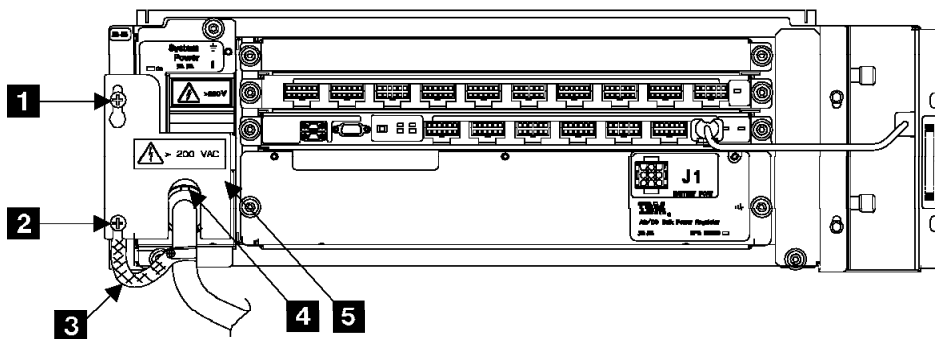
Figure 95. Bulk Power Supply (t007440l)

__ 12. Continue with "Checking the 2105 Model 100 Switch Settings".

Checking the 2105 Model 100 Switch Settings

__ 1. Ensure the UEPO switch **1** on both BPSs is set to NORMAL (left).
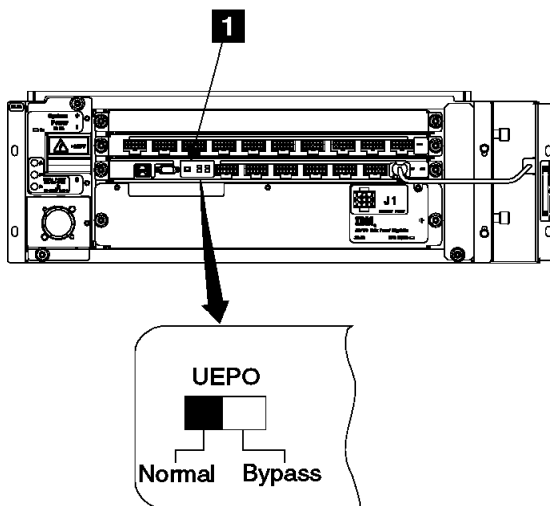
Figure 96. Bulk Power Supply Panel (t007369m)

__ 2. Set the 2105 Model 100 rack operator panel switches to the positions shown in Table 14.

Table 14. 2105 Model 100 Rack Operator Panel Switches

Switch Name	Position
Unit Emergency **2**	Off (O, down)
Local/Remote Switch (inside door) **3**	Push Down

Note: Pull the Local/Remote switch **3** out before changing its position.
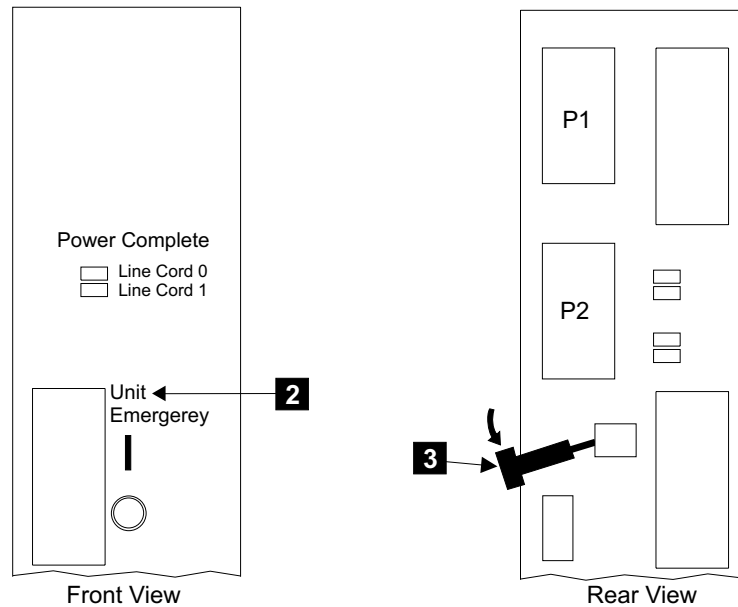
Figure 97. 2105 Model 100 Rack Operator Panel Switches (t007103m)

__ 3. Remove the "Do Not Operate" tag and the lockout padlock from each customer mainline ac voltage circuit breaker.

__ 4. Instruct the customer to switch on each circuit breaker that supplies the mainline ac power to each customer ac power outlet or wired mainline power cable.

__ 5. Switch the System Power CB **4** on the front and rear bulk power supplies to On (|, up) on each rack.
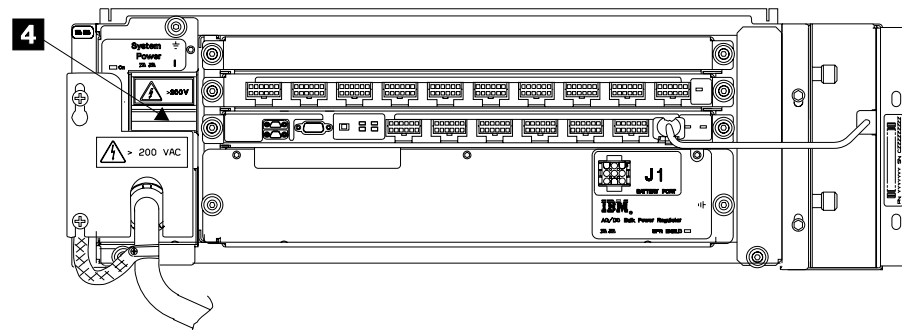
Figure 98. Bulk Power Supply (t007257l)

__ 6. Determine if the 350 V battery feature (FC 1000) is installed in each rack:

   • If the 350 V battery feature is *not* installed, it must be installed now.

   Attention: This installation can not continue unless the Additional 350 V Battery Feature (FC 1000) is installed on the 2105 Model 100s. If the battery feature is not installed, the customer will be exposed to loss of access to all volumes in the 2105 Model 100s.

   • If the 350 V battery feature *is* installed, continue with this step.

__ 7. Verify that the front and rear 350 V battery cables are connected to the J1 connector on the 350 V battery **5** and the J1 Battery Power connector on the BPS. Check each rack.

Attaching the 2105 Model 100

> **Note:** Set the 350 V battery circuit breaker to Off before connecting the 350 V battery cable.

__ 8. Set the front and rear 350 V battery circuit breakers (CB) **6** to On (|, up).
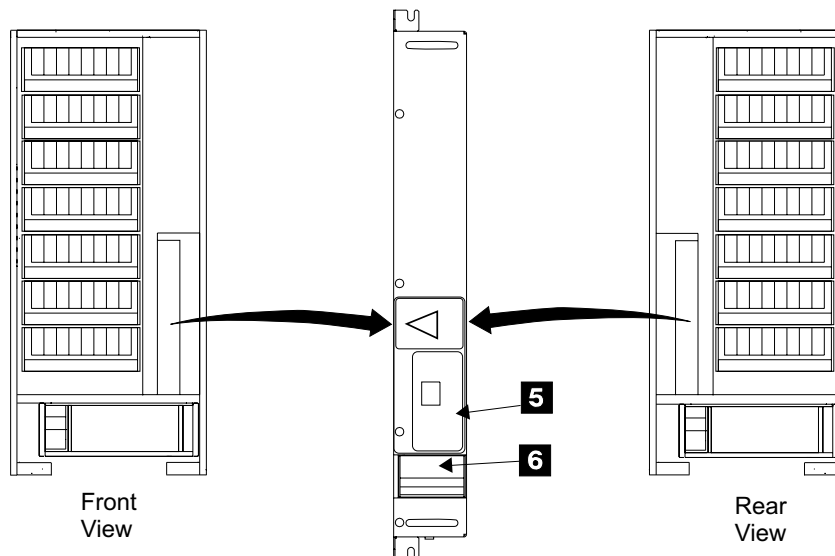
Figure 99. 2105 Model 100 350 V Battery Circuit Breaker (t008981m)

__ 9. Continue with "Installing Bulk Power Interconnect Cables".

Installing Bulk Power Interconnect Cables

This procedure will install the bulk power interconnect cables between the:

- 2105 Model Exx/Fxx (R1) and the first 2105 Model 100 (R2) rack.

   Note, R2 is the power head-of-string and should be the 2105 Model 100 rack closest to the 2105 Model Exx/Fxx.

- 2105 Model 100 (R2) to the attached second 2105 Model 100 (R3) rack.

2105 Subsystem (front View)

| Rack 1 (R1-) | Rack 2 (R2-) | Rack 3 (R3-) |

2105 Model Exx/Fxx | 2105 Model 100 | 2105 Model 100
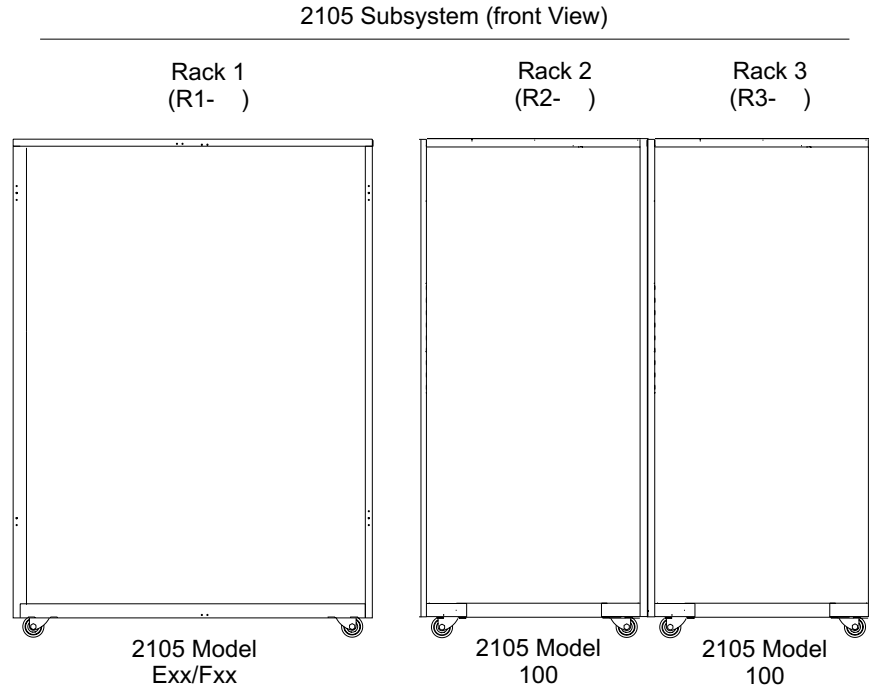
Figure 100. Suggested 2105 Rack Positions for 2105 Model 100s (s008856n)

__ 1. Connect the bulk power interconnect ″Y″ cable P/N 34L5521 (supplied in FC 1121 compatibility ship group) between 2105 Model Exx/Fxx (R1) RPC-1 P3 connector and the front bulk power supply of the first 2105 Model 100 (R2, head-of-string) connector J8b **1** and then to the first 2105 Model 100 (R2) Operator panel connector P1 **4** . See Figure 101 on page 118 and Figure 102 on page 118.

__ 2. Connect the bulk power interconnect ″Y″ cable P/N 34L5522 (supplied in FC 1121 compatibility ship group) between 2105 Model Exx/Fxx (R1) RPC-2 P3 connector and the rear bulk power supply of the first 2105 Model 100 (R2, head-of-string) connector J8b **1** and then to the first 2105 Model 100 (R2) Operator panel connector P2 **5** .

__ 3. Connect the two bulk power supply interconnect cables (supplied with FC 1122 for the second 2105 Model 100 subsystem) between the first 2105 Model 100 (R2) and the next 2105 Model 100 (R3) front and rear bulk power supplies:

   • R2 bulk power supply connector J7t **2** to R3 bulk power supply connector J9b-A **3** .

   Notes:

   a. The two interconnect cables run through the openings in the sides of the attached 2105s. Do not attempt to route these cables through the 2105 tailgates. The connector that attaches to J7t must be re-labeled for later use.

   b. If there already is a power cable connected to J7t, disconnect it. This is an unused power cable to the unused drawer position 6.

Attaching the 2105 Model 100

1 J8b, R1 to R2 input connector

2 J7t, R2 to R3 output connector

3 J9b-A, R3 input
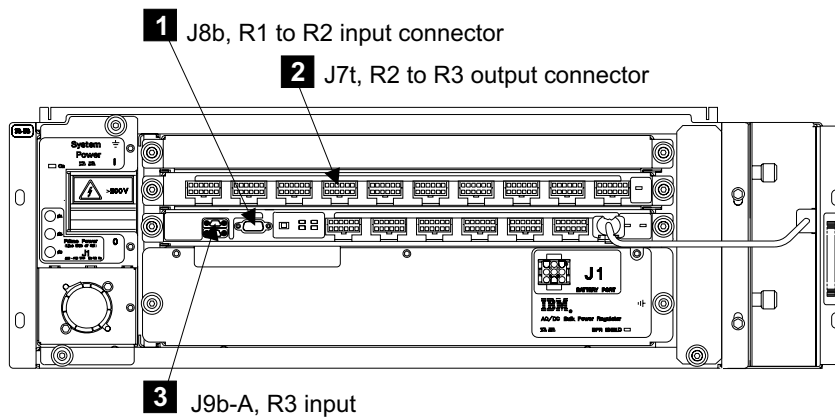
Figure 101. Head-of-String (R2) Bulk Power Connectors (t009043)

Front View

Rear View
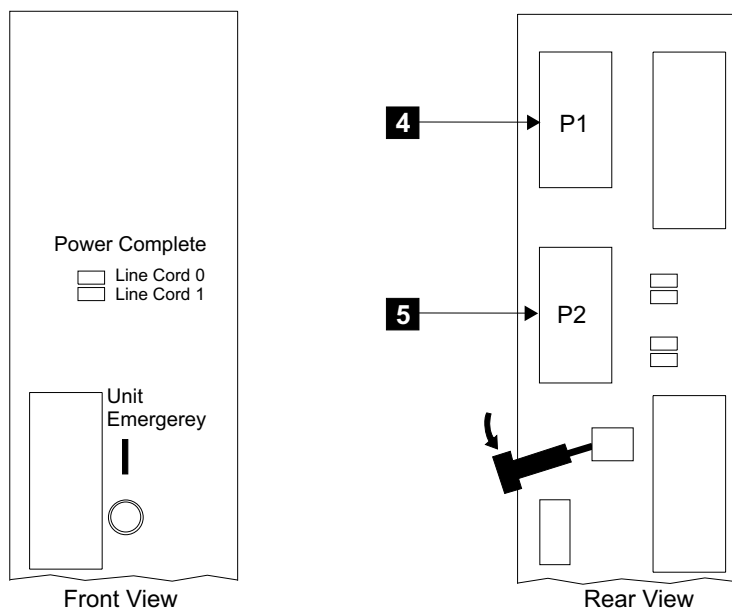
Figure 102. 2105 Model 100 Rack Operator Panel Switches (t009044)

__ 4. Does the customer have existing 7133s that they want physically installed into the 2105 Model 100 racks?

• **Yes**, go to "Physically Installing a 7133 Device Drawer" on page 137. Return here after all of the 7133s have been installed.

• **No**, continue with "How to Power on the 2105 Model 100 and Test the Installation".

How to Power on the 2105 Model 100 and Test the Installation

This section describes the actions that should be done to power on and test the 2105 Model 100 subsystem.

• Powering on the 2105 Model 100

• Attachment and activation of the service terminal.

• Installation using the service terminal.

Check the 2105 Model 100 Rack Operator Panel Switches

Attention: Do not install any cables until you are instructed to do so.

__ 1. Set the Unit Emergency switch, see Figure 104, to On (|, up) on each 2105 Model 100.

__ 2. On the 2105 Model Exx/Fxx operator panel, set the Local Power switch to On (|, up) momentarily, then release it.

> **Note:** This operator panel is on the 2105 subsystem that the 2105 Model 100 is attaching to.
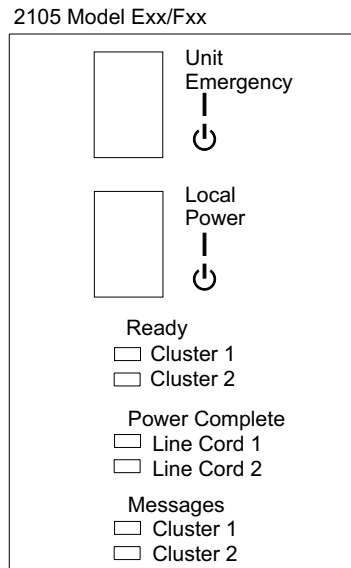
2105 Model Exx/Fxx

Figure 103. 2105 Model Exx/Fxx Operator Panel Locations (S008814m)

__ 3. Observe the Power Complete indicators for Line Cords 0 and 1 on the 2105 Model 100 operator panel and **perform the action described in Table 15 on page 120**.

You may have to wait up to four minutes for the final state of the Power Complete, Line Cord indicators on the 2105 Model 100 (indicators stop blinking and remain on).

Attaching the 2105 Model 100

Front View
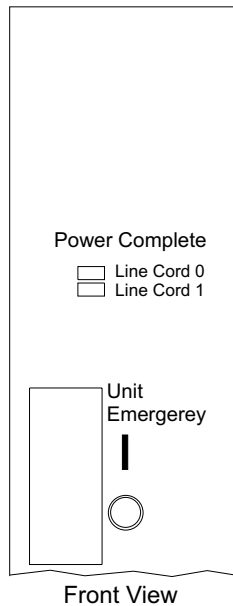
Figure 104. 2105 Model 100 Rack Operator Panel Indicators (t008851m)

Table 15. 2105 Model 100 Rack Operator Panel Power Complete Indicators

Power Complete, Line Cord 0	Power Complete, Line Cord 1	Action
On	On	Normal, go to step 4.
On	Off	Go to "MAP 2420: Isolating 2105 Model 100 Power On Problems" on page 29.
Off	On	Go to "MAP 2420: Isolating 2105 Model 100 Power On Problems" on page 29.
Off or blinking	Off or blinking	Go to "MAP 2420: Isolating 2105 Model 100 Power On Problems" on page 29.

__ 4. Ensure each System Power On indicator on both the front and rear bulk power supply is on.

If either System Power indicator is off, go to "MAP 2000: Entry for Visual Power Symptoms" on page 19 to isolate the problem.
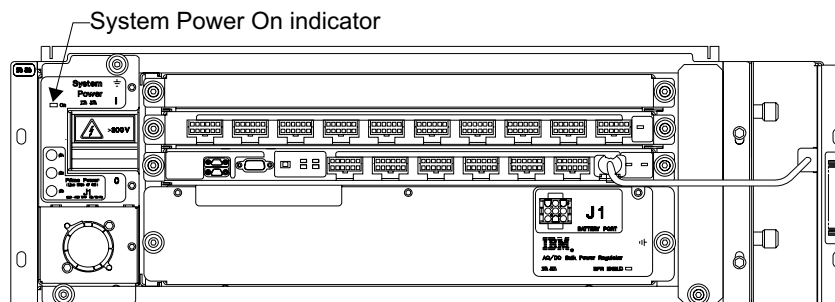
Figure 105. Bulk Power Supply (t007104l)

__ 5. Ensure that all SSA DASD Model 020 and 040 drawers in the 2105 Model 100 are powered on. Do the Model 020 drawer and Model 040 drawer power checks in the following steps as required:

• **Model 020 drawer**, go to step 6 on page 121.

• **Model 040 drawer**, go to step 7 on page 122.

__ 6. **Model 020 drawers**, check the indicators on all Model 020 drawers in the 2105 Model 100: Refer to Figure 106 on page 122.

> **Note:** The fan-and-power-supply PWR (power) indicators **8** may be hidden by the fan mounting latches.

SSA DASD drawer Subsystem Power indicator **5** :	On
SSA DASD drawer Subsystem Check indicator **6** :	Off
All three fan-and-power PWR (power) indicators **8** :	On
All three fan-and-powe CHK (check) indicators **7** :	Off
All disk drive module Power indicators **1** :	On

• If all of the Power indicators are on, and all the Check indicators are off, continue with "Connecting the Service Terminal to the 2105 Model Exx/Fxx" on page 123.

• If any Power indicator or Ready indicator fails to come on, or any Check indicator fails to go out, go to ″MAP 3151″ in the 2105 Model Exx/Fxx Service Guide.

When all the Model 020 drawer Power indicators and Ready indicators are on, and all the Check indicators are off, continue with "Connecting the Service Terminal to the 2105 Model Exx/Fxx" on page 123.

Attaching the 2105 Model 100
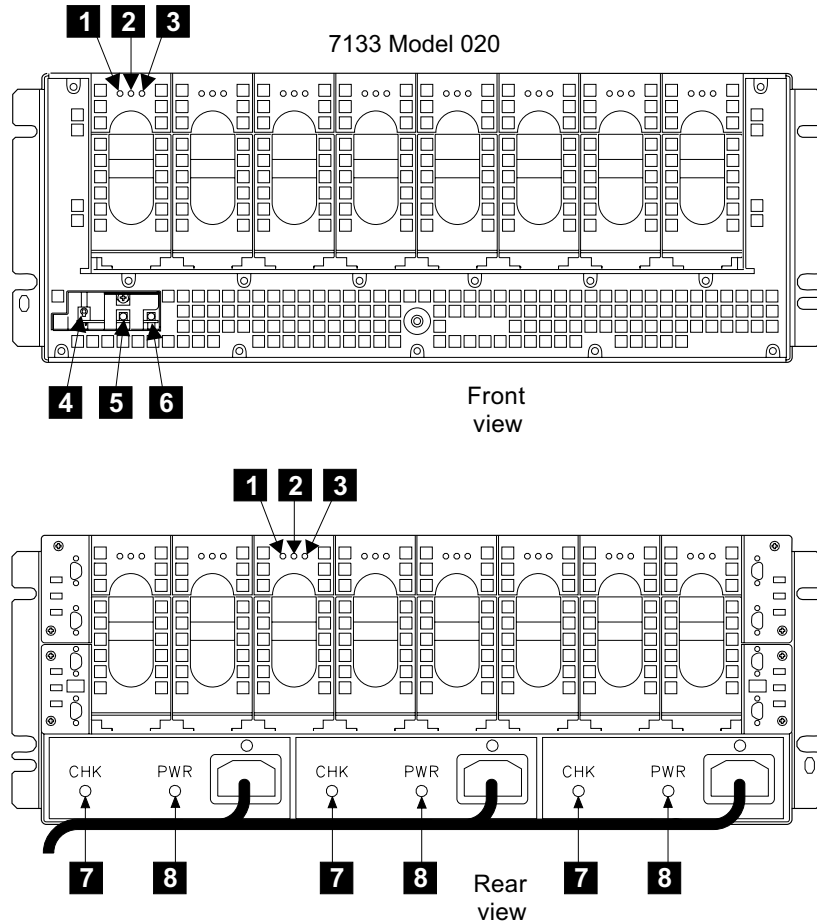
Figure 106. SSA DASD Drawer Indicators (t007209p)

__ 7. **Model 040 drawers**, check the indicators on all Model 040 drawers in the 2105 Model 100: Refer to Figure 107 on page 123.

SSA DASD drawer controller card check indicator **11** :	Off
All three fan assembly PWR (power) indicators **12** :	On
All three fan assembly CHK (check) indicators **13** :	Off
Both power supply assembly PWR (power) indicators **14** :	On
Both power supply assembly CHK/PWR Good indicators **15** :	On, green

- If all of the Power indicators and Ready indicators are on, and all the Check indicators are off, continue with "Connecting the Service Terminal to the 2105 Model Exx/Fxx" on page 123.
- If any Power indicator or Ready indicator fails to come on, or any Check indicator fails to go out, go to ″MAP 3151″ in the 2105 Model Exx/Fxx Service Guide.

  When all the Model 040 drawer Power indicators and Ready indicators are on, and all the Check indicators are off, continue with "Connecting the Service Terminal to the 2105 Model Exx/Fxx" on page 123.

7133 Model 040

Front View

Rear View
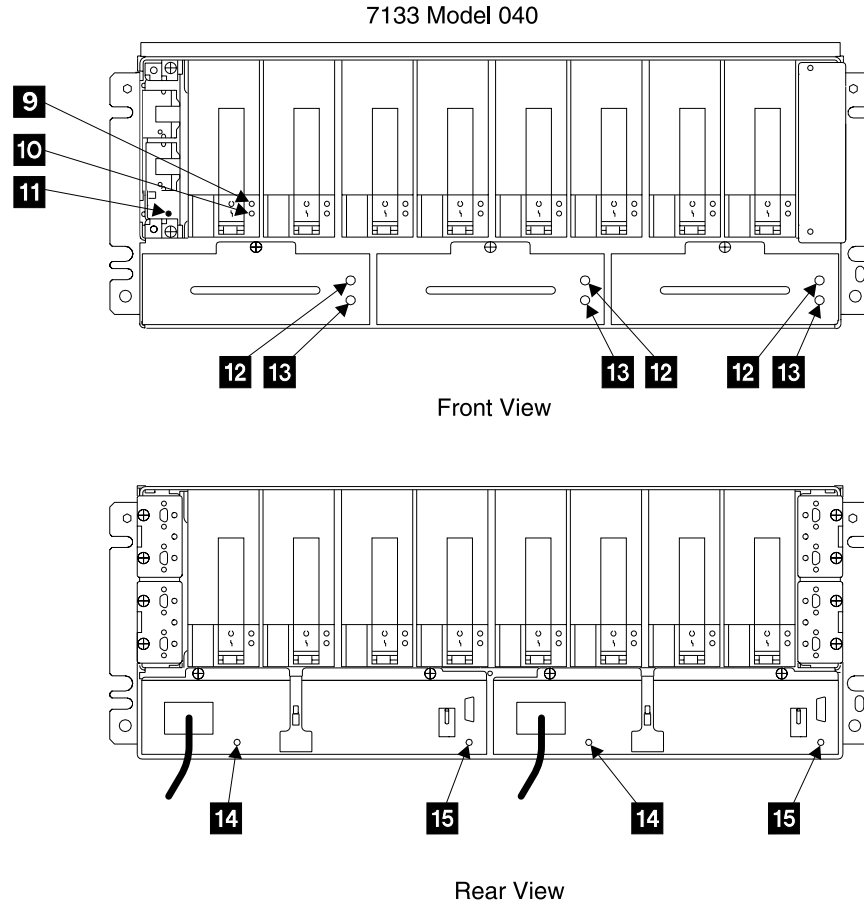
Figure 107. Model 040 Drawer and DDM Indicators (t007612p)

__ 8. Continue with "Connecting the Service Terminal to the 2105 Model Exx/Fxx".

Connecting the Service Terminal to the 2105 Model Exx/Fxx

Attention: The 2105 and cables in this procedure are ESD-sensitive. Always wear an ESD wrist strap during this procedure. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: The service terminal will connect to the 2105 subsystem that this 2105 Model 100 is being attached to. Go to the 2105 Model Exx/Fxx subsystem.

__ 1. Ensure that AC power is available to the service terminal at the convenience outlet power cord. If required, route and connect the service terminal convenience outlet power cord:

   a. Locate the service terminal convenience outlet power cord in the ship group.

      Note: This cable is ordered as a separate feature code but is shipped with the ship group. The cable connector must match the receptacle supplied by the customer.

   b. Route the convenience outlet power cord through the center tailgate **3** .

   c. Route the convenience outlet power cord **1** up the center of the 2105 Model Exx/Fxx and loop it twice through the cable retainer. Allow enough cable so the connector can reach the service terminal table **2** .

d. Connect the convenience outlet power cord to the AC service provided by the customer.
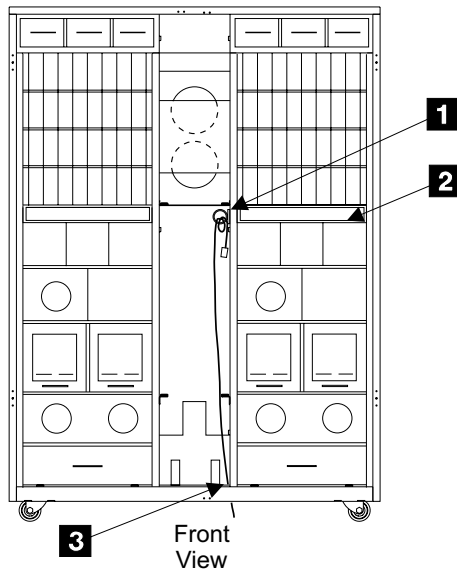
Figure 108. Service Terminal Utility Power Cord Routing (S007634m)

__ 2. Press the latches on the front service terminal table **4** and pull the table out until it stops.
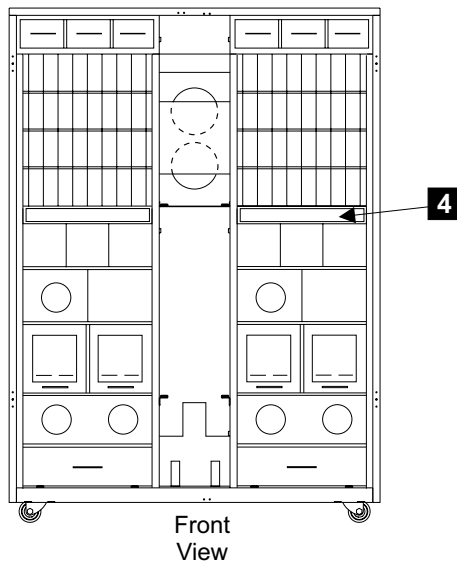
Figure 109. Accessing the Service Terminal Table (S008607m)

__ 3. Place the service terminal on the pullout service terminal table.

__ 4. Connect the service terminal AC adapter cable to the service terminal.

__ 5. Connect the service terminal AC adapter to the utility power cord, **1** in Figure 108.

> **Note:** Always operate the service terminal from AC power because the duration of the service activity may exceed the capacity of the service terminal battery.

__ 6. Connect the service terminal null modem cable (P/N 08L8045, in the ship group), to cluster bay 1:

   a. Connect the service terminal interface cable to the serial port connector (9 pin) on the service terminal.

   b. Connect the other end of the cable to S2 on the front of cluster bay 1.

   > **Note:** The service terminal interface cable is stored in the 2105 Model Exx/Fxx rack or connected to S2 on the front of cluster bay 1.
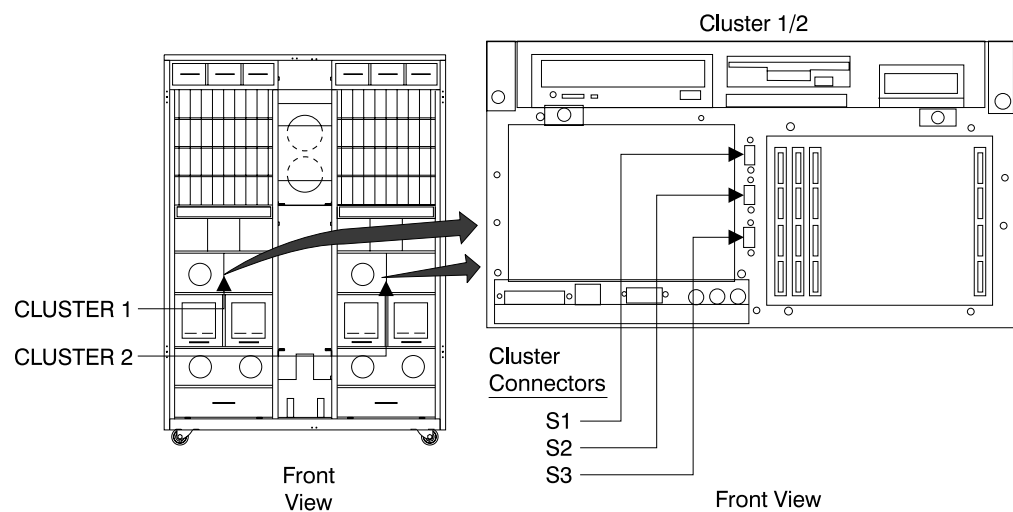
Figure 110. Cluster Bay Connectors for Service Terminal (S008027m)

__ 7. Verify that the Ready indicators on the operator panel for Cluster 1 and Cluster 2 are on.

   > **Note:** If the 2105 Model Exx/Fxx subsystem was just powered on, you may have to wait up to 30 minutes for AIX to finish booting.

   Are the Cluster 1 and 2 Ready indicators on?
   - **Yes**, Continue with the next step.
   - **No**, go to ″MAP 4360″ in the 2105 Model Exx/Fxx Service Guide.

Attaching the 2105 Model 100

2105 Model Exx/Fxx

Unit
Emergency

Local
Power

Ready
▭ Cluster 1
▭ Cluster 2

Power Complete
▭ Line Cord 1
▭ Line Cord 2

Messages
▭ Cluster 1
▭ Cluster 2
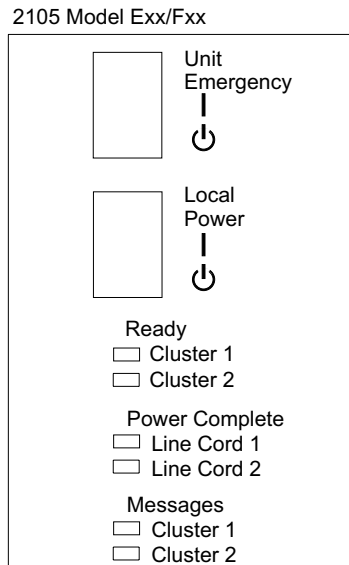
Figure 111. 2105 Model Exx/Fxx Operator Panel Locations (S008814m)

__ 8. Power the service terminal on.

__ 9. Login then verify that the Copyright and Login screen is displayed for cluster bay 1:

- If the copyright screen is not displayed for cluster bay 1, go to ″MAP 6060″ in the 2105 Model Exx/Fxx Service Guide. After the repair, return here and continue with the next step.
- If the copyright screen is displayed for cluster bay 1, enter the login ID of **service** (lower case) and press enter. Then continue with the next step.

__ 10. From the service terminal toolbar, click on toolbar option ″Disconnect″.

__ 11. Move the service terminal interface cable from the S2 connector on cluster bay 1 to the S2 connector on cluster bay 2.

__ 12. From the service terminal toolbar, click on toolbar option ″Connect″.

__ 13. Login then verify that the Copyright and Login screen is displayed for cluster bay 2:

- If the copyright screen is not displayed for cluster bay 2, go to ″MAP 6060″ in the 2105 Model Exx/Fxx Service Guide. After the repair, return here and continue with the next step.
- If the copyright screen is displayed for cluster bay 2, enter the login ID of **service** (lower case) and press enter.

__ 14. Continue with "Installing the 2105 Model 100 Using the Service Terminal".

Installing the 2105 Model 100 Using the Service Terminal

The service terminal will guide you through the logical installation and configuration of all racks and 7133s attached to the 2105 Model 100.

__ 1. Ensure that the Configuration Worksheets are available and have been completed by both the customer and the service representative. Refer to the Worksheets found in the *IBM Enterprise Storage Server Configuration Planner* book, form number GC26-7353.

__ 2. From the service terminal **Main Service Menu**, select:

> **Install/Remove Menu**
>> **Rack Menu**
>>> **Install an Additional Rack**

__ 3. Using the configuration worksheets, follow the instructions on the service terminal to install all 2105 Model 100 racks.

Notes:

a. First logically install the racks starting with the 2105 Model 100 (R2) and then from left to right, installing each additional 2105 Model 100 rack. If the subsystem has two 2105 Model 100s, the first 2105 Model 100 becomes R2 and the second 2105 Model 100 becomes R3.

b. When each Logical rack installation is completed:

- If there are no more racks to install, continue with the next step.
- If there are additional racks to install, press **PF3** until the **Install an Additional Rack** screen is displayed. Install the next rack.

2105 Subsystem (front View)

Rack 1 (R1-)	Rack 2 (R2-)	Rack 3 (R3-)

2105 Model Exx/Fxx	2105 Model 100	2105 Model 100
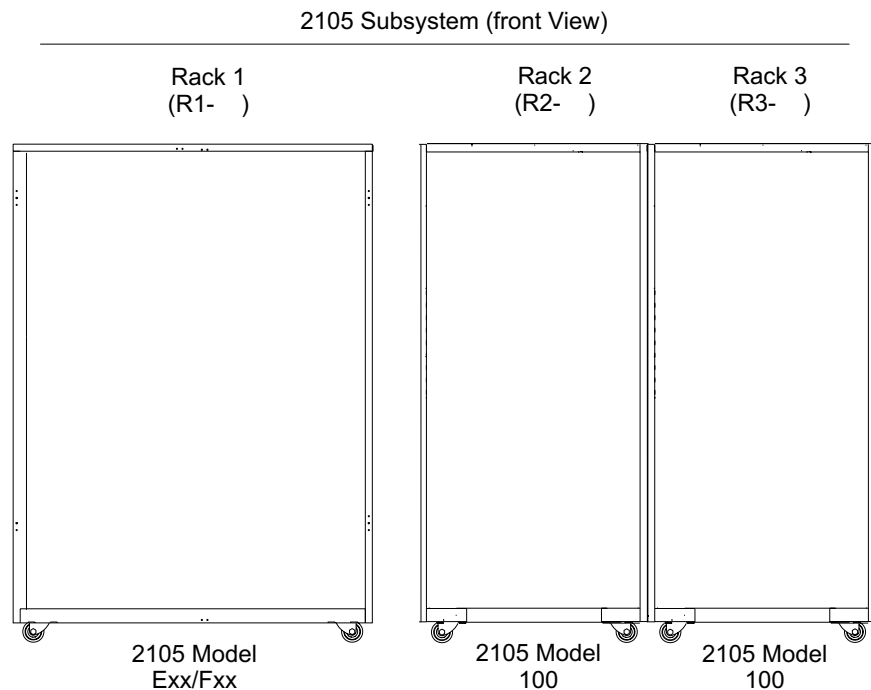
Figure 112. 2105 Model 100 Rack Location Identification (s008856n)

__ 4. Continue with "Complete the Physical Installation of the 2105".

Complete the Physical Installation of the 2105

This section describes the actions that will be done after the installation using the service terminal has completed.

- Check the rack 350 V battery indicators.
- Indicator problem repair.

__ 1. Ensure that the Battery Enbld (Enabled) indicator **1** on the front and rear 350 V batteries, for each rack, are both on.

- If both Battery Enabled indicators are on, continue with "Completing the Installation of the 2105 Model 100 Racks" on page 128.

- If the Battery Enabled indicator is off, verify that the 350 V battery circuit breaker (CB) **2** is set to On (|, up).
  - If the Battery Enabled indicator is now on, continue with "Completing the Installation of the 2105 Model 100 Racks".
  - If the Battery Enabled indicator is still off, go to "MAP 2350: Isolating BPC (BPS) Good Indicator Blink Codes" on page 21, and then return here and continue.
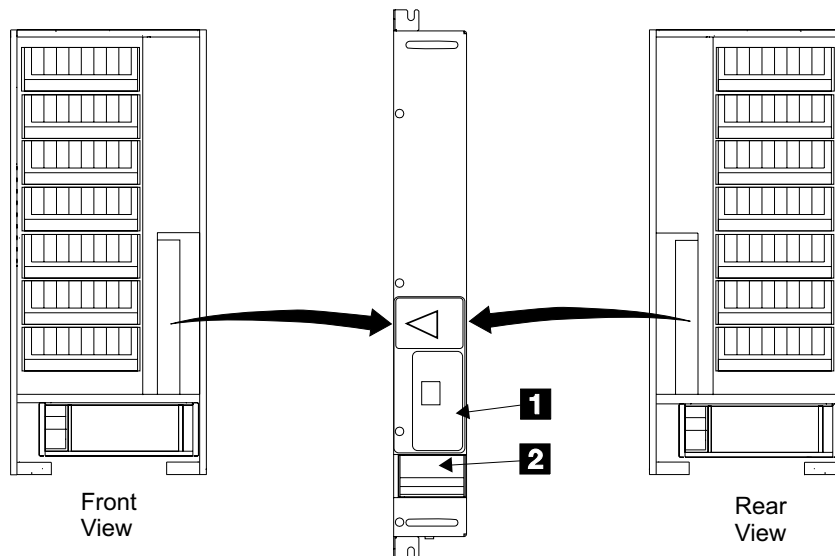
Figure 113. 2105 Model 100 350 V Battery Indicators (t008983m)

__ 2. **Attention:** You are now ready to logically install the 7133 device drawers. Continue with "Logically Installing the 7133 Device Drawers" on page 151.

Completing the Installation of the 2105 Model 100 Racks

This section describes the actions that should be done after the 2105 Model 100 has been physically installed.

- Activate the LIC feature control records
- Configure the 2105 Model 100 subsystem
- Update installation records
- Organize installation documents and forms

Activating LIC Features

Note: This procedure requires the LIC Feature Control Records diskette with added features (FC 1121, FC 1122, and 7133s). This diskette may have been provided in the ship group or MES or it may have been created earlier during installation. See "LIC Feature Control Record Extraction" on page 96.

Requirements:

Must have the DOS diskette containing the LIC Feature Control Record specifically written for the selected 2105 storage server. The diskette will be labeled **FEA#####.BIN**, with **#####** the serial number of the 2105.

Procedure:

1. Connect the service terminal interface cable to the S2 connector on the front of cluster bay 1.

2. Log the service terminal into cluster bay 1.

   From the service terminal **Main Service Menu**, select:

   > **Licensed Internal Code Maintenance Menu**
   >> **LIC Feature Menu**
   >>> **Activate LIC Feature**
   >>> a. Follow all of the screen instructions, they will guide you through the diskette insertion and removal steps.
   >>> b. When completed, all LIC features will be enabled per the file record on the diskette.

Configuring the 2105 Model 100

__ 1. **Perform the logical configuration of the 2105 Model 100**, using the Configuration Worksheets found in the *IBM Enterprise Storage Server Configuration Planner* book, form number GC26-7353.

   Notes:
   a. If the customer chooses to perform their own logical configuration using the ESS Specialist, this procedure is not necessary.
   b. When storage is being added to a previously configured SSA loop, the ESS Specialist must be used. The ESS Batch Configuration Tool (below) can only be used on previously un-configured SSA loops.

__ 2. From the service terminal **Main Service Menu**, select:

   > **Configuration Options Menu**
   >> **ESS Batch Configuration Tool Menu**
   >>> **Define a Storage Configuration**

   >>> **Note:** Check if the SSA card that you want to configure is in the **A List of All Unconfigured SSA Cards**. If the SSA card is not listed, the drawers belonging to that SSA card must be configured using the ESS Specialist.

   >>> Enter the information from the Configuration Worksheets found in the *IBM Enterprise Storage Server Configuration Planner* book, form number GC26-7353.

   >>>> **Apply Defined Storage Configuration List**

   >>>> **Note:** The application of the Defined Storage Configuration is a background process that may take several hours to complete. This installation procedure will later use the **Display Status of Apply Process** to verify completion status before giving the 2105 to the customer.

   >>> **Perform ESS Specialist Configuration from ESSNet Console**

   >>> If additional configuration needs to be completed, use the ESS Specialist from the ESSNet console.

   Return here when the configuration is completed and continue with the next step.

__ 3. Continue with step "Completing the Installation" on page 130.

Completing the Installation

___ 1. Read the following Danger notice before continuing.

DANGER

> **Customers can be exposed to lethal AC voltages if the mainline power cable retention plates are not installed. The front and rear mainline power cable retention plates must be installed before the machine is returned to the customer. (1010)**

Verify that the front and rear mainline power cable retention plates **2** and mainline power cable ground straps **1** are installed.
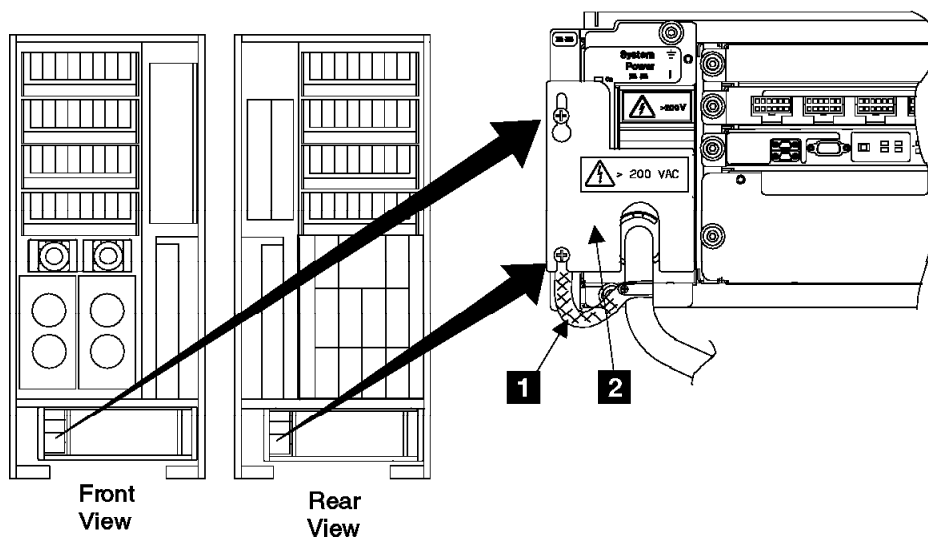
Figure 114. Mainline Power Cable Retention Plates (t007348m)

___ 2. Verify that the mainline power cable, SSA cables going to the attached subsystem, and all other cables that pass through the 2105 Model 100 tailgates, are held by the front **3** and rear **4** tailgate cable clamps. Verify that the tailgate EMC hardware is installed correctly. See "2105 Model 100 Tailgate Cable Clamp Removal and Installation" on page 131, as required.

Note: Refer to *2105 Model Exx/Fxx Tailgate Cable Clamp Removal and Installation* in the chapter 5 of the 2105 Model Exx/Fxx service guide.
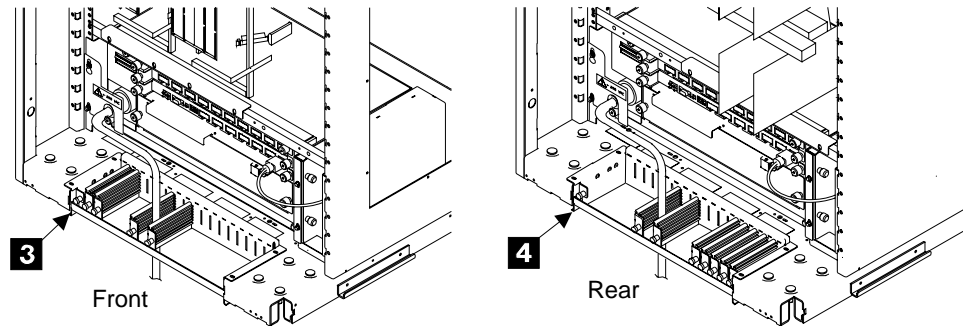
Figure 115. Cable Strain Relief Clamps (t007516l)

__ 3. Before returning the 2105 to the customer, verify that the storage configuration is complete:

From the service terminal **Main Service Menu**, select:

> **Configuration Options Menu**
>> **ESS Batch Configuration Tool Menu**
>>> **Display Status of Apply Process**
>>> Configuration is complete when the status shows
>>> **Application of the Defined Configuration Successfully Completed**.

> **Note:** If additional configuration needs to be completed, use the ESS Specialist from the ESSNet console.

__ 4. Refer to "Chapter 2. Entry MAP for All Service Actions" on page 13 for other 2105 subsystem hardware installation procedures.

__ 5. Disconnect the service terminal cables from the 2105 Model Exx/Fxx and remove the service terminal from the table.

__ 6. Place copies of the IPR configuration, spare ship group components and CD-ROMs, spare labels, and the cable planning worksheets in the 2105 Model Exx/Fxx document enclosure for future reference and use.

__ 7. Place the attachment service guide and parts catalog in the 2105 Model 100 document enclosure of the R2 frame.

__ 8. Complete all installation records.

__ 9. Update the account records to include this installation.

__ 10. Reference the pack/unpack instructions for return/discard information. Discard the shipping material locally.

Installation Complete

The installation of the IBM 2105 Versatile Storage Server subsystem attached to a 2105 Enterprise Storage Server subsystem is complete.

2105 Model 100 Tailgate Cable Clamp Removal and Installation

Attention: This is *not* a stand-alone procedure. You should have started this procedure at the service terminal.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when working with cable and clamps in the tailgate area. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Tailgate EMC Hardware Removal

The tailgate EMC hardware must be removed to access the tailgate cable clamps. Use Figure 116 for this procedure, drawings may not match hardware.

___ 1. Do this procedure to remove the EMC hardware from the front, rear, or front and rear tailgates. For tailgate locations, see Figure 117 on page 133.

   Note: If you do not know which tailgate you are working on, see step 2 on page 133.

___ 2. Remove the two screws **1** and **2** from the mainline power cable clamp and EMC plate.

___ 3. Remove the mainline power cable clamp **4** and the EMC plate **3** .

___ 4. Remove the two screws **5** and **7** from the EMC plate bracket **6** , then remove the bracket with the attached EMC plates.

___ 5. Continue with "Tailgate Cable Clamp Removal for 2105 Model 100" on page 133.
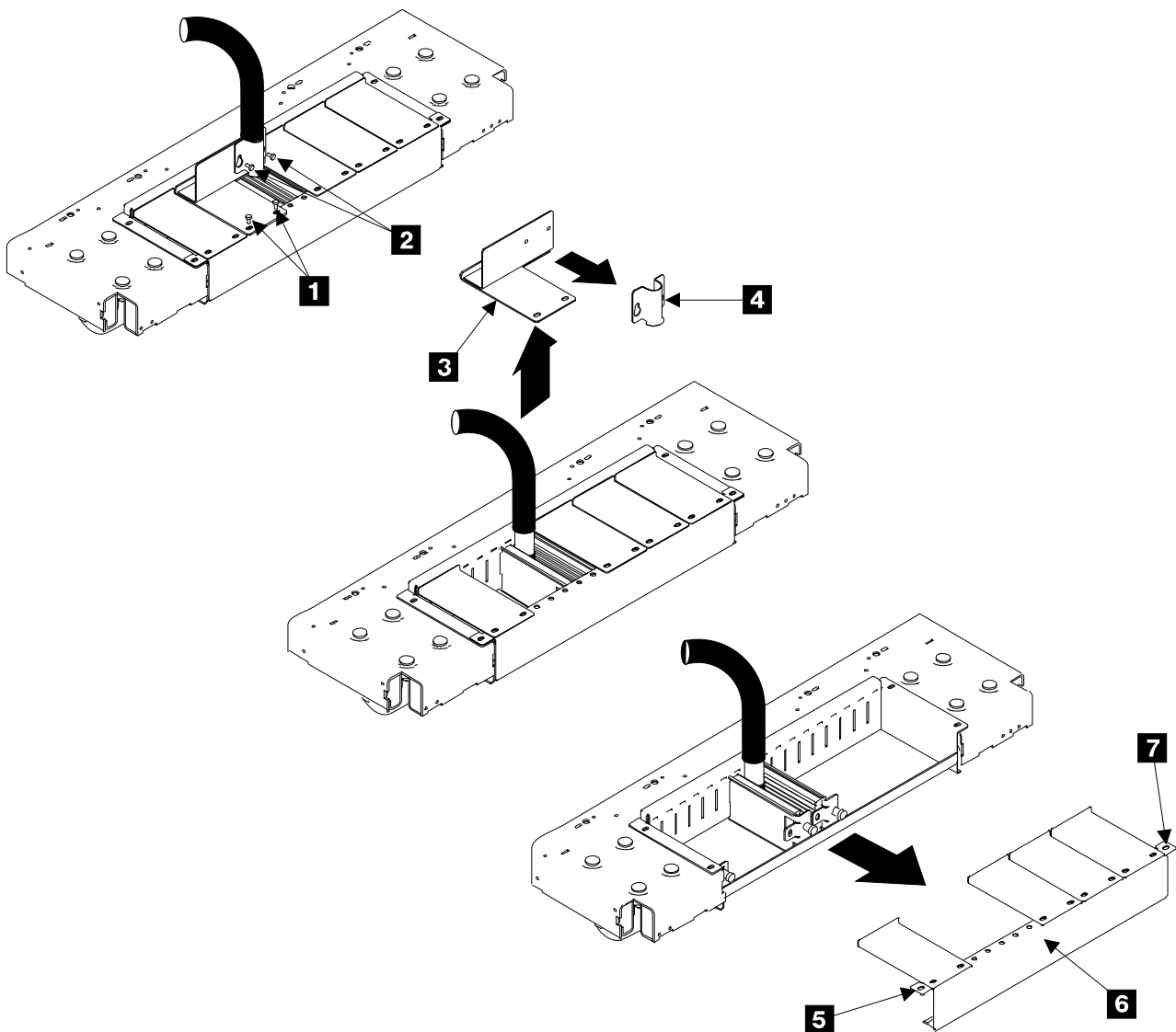
Figure 116. Tailgate EMC Hardware Removal (t007492q)

Tailgate Cable Clamp Removal for 2105 Model 100

__ 1. The 2105 Model 100 has cable clamps in the front ▌1▐ and rear ▌2▐ tailgate area.

The tailgate cable clamp positions in the tailgate are numbered from 1 on the left, to 16 on the right. The 2105 Model 100 has cable clamps in positions 6 and 8 in the front and rear tailgates.
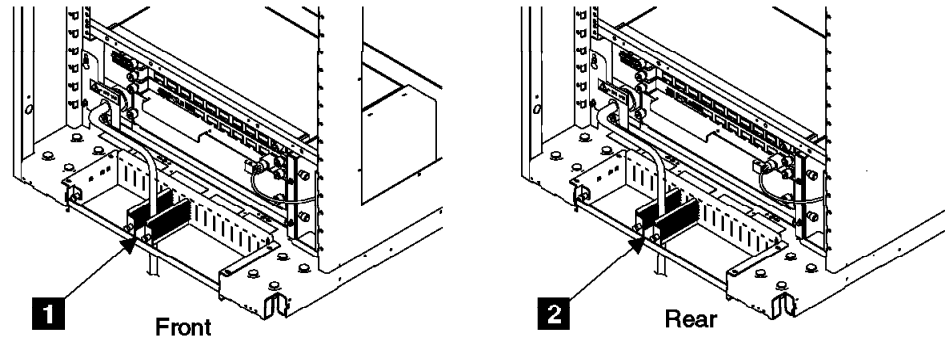
Figure 117. 2105 Model 100 Front and Rear Tailgates (t007377l)

__ 2. Determine which tailgate cable clamps to remove.

Find the installation activity, or the mainline power cable you will be retaining in the following list. Note which tailgate you will be removing cable clamp 8 from.

Note: All of the cable clamps in position 8 are held in the tailgate by a screw from below.

- **2105 Model 100 Installation**,
    - Front Tailgate, cable clamp 8, see Figure 118 on page 134
    - Rear Tailgate, cable clamp 8, see Figure 118 on page 134
- **Front mainline power cable**,
    - Front Tailgate, cable clamp 8, see Figure 118 on page 134
- **Rear mainline power cable**,
    - Rear Tailgate, cable clamp 8, see Figure 118 on page 134

2105 Model 100 Tailgate Cable Clamp Removal and Installation

2105 Model 100, Front and Rear Tailgates
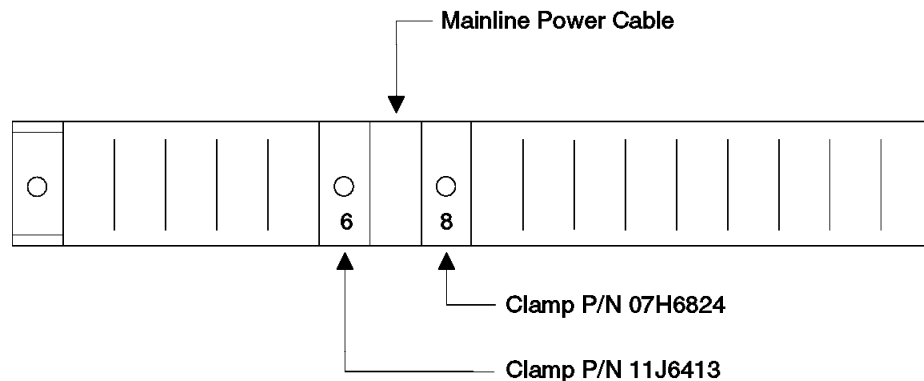
Figure 118. 2105 Model 100 Front and Rear Tailgate Cables and Cable Clamp Locations (5007450m)

__ 3. Remove cable clamp 8 from the tailgate indicated in step 2 on page 133.

    a. Note the position of cable clamp 8 **3** , so it can be installed in the same position.

    b. Remove the screw **4** from the bottom of cable clamp 8.

    c. Rotate the front of cable clamp 8 to the right **5** , then lift it out of the rear slot in the tailgate.

    d. Repeat the above steps on cable clamp 8 in the other tailgate if required.
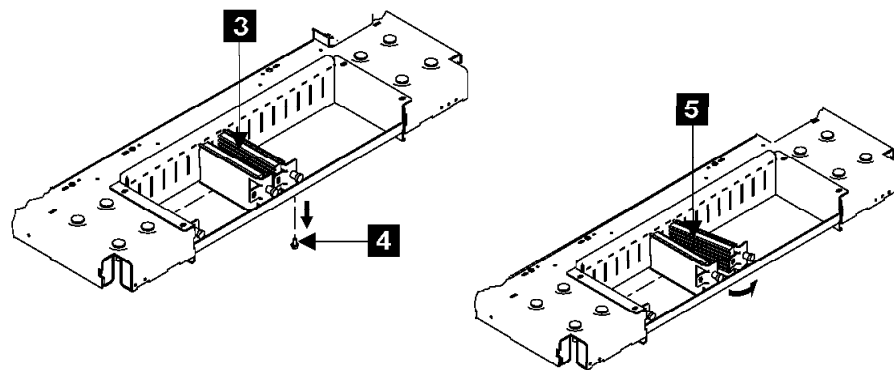
Figure 119. 2105 Model 100 Front and Rear Tailgate Cable Clamp Removal (t007466l)

__ 4. Continue with "Tailgate Cable Clamp Installation 2105 Model 100".

Tailgate Cable Clamp Installation 2105 Model 100

__ 1. The 2105 Model 100 has cable clamps in the front **1** and rear **2** tailgate area.

The tailgate cable clamp positions in the tailgate are numbered from 1 on the left, to 16 on the right. The 2105 Model 100 has cable clamps in positions 6 and 8 in the front and rear tailgates.

2105 Model 100 Tailgate Cable Clamp Removal and Installation
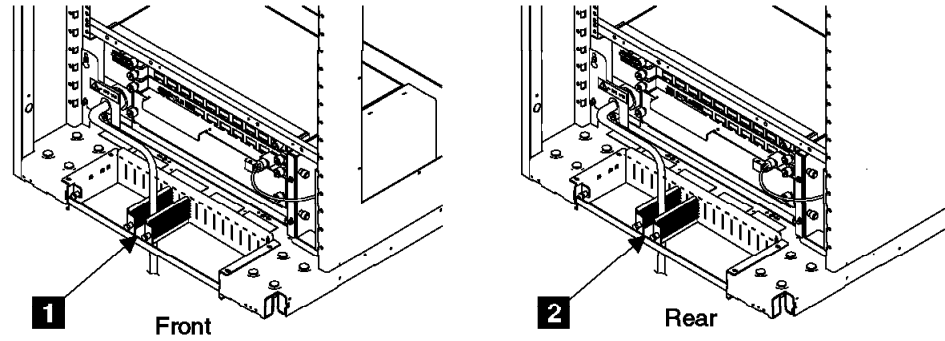
Figure 120. 2105 Model 100 Front and Rear Tailgates (t007377l)

__ 2. Determine which mainline power cables and tailgate cable clamps to install.

Find the installation activity, or the mainline power cable you will be retaining in the following list. Note which tailgate you will be installing the mainline power cable and clamp 8 into.

Note: All of the cable clamps in position 8 are held in the tailgate by a screw from below.

- **2105 Model 100 Installation**,
  - Front Tailgate, install front mainline power cable between tailgate cable clamps 6 and 8, see Figure 121
  - Rear Tailgate, install rear mainline power cable between tailgate cable clamps 6 and 8, see Figure 121
- **Front mainline power cable**,
  - Install front mainline power cable between front tailgate cable clamps 6 and 8, see Figure 121
- **Rear mainline power cable**,
  - Install rear mainline power cable between rear tailgate cable clamps 6 and 8, see Figure 121

2105 Model 100, Front and Rear Tailgates
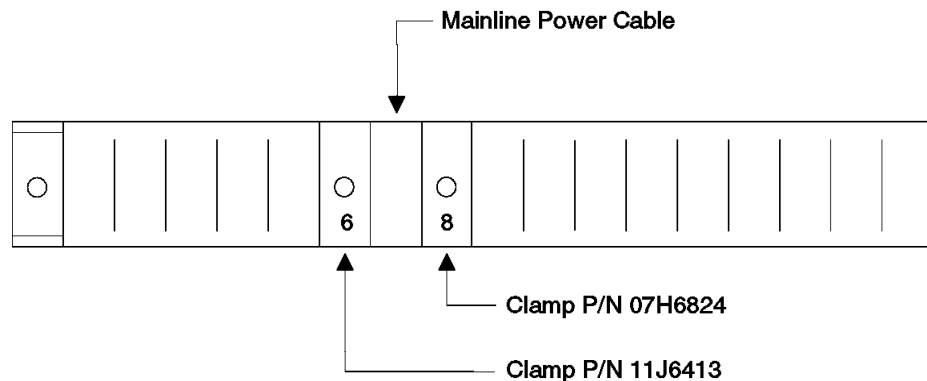
Figure 121. 2105 Model 100 Front and Rear Tailgate Cable and Cable Clamp Locations (5007450m)

2105 Model 100 Tailgate Cable Clamp Removal and Installation

___ 3. Install the mainline power cable and cable clamp 8 into the tailgate indicated in step 2 on page 135.

    a. Position the mainline power cable against the right side of cable clamp 6 **3** .

    b. Insert the end of the free cable clamp into the slot for clamp location 8 **4** .

    c. Rotate cable clamp 8 to the right against the mainline power cable.

       Note: Position the mainline power cable in the tailgate so the cables exposed metal braid will be clamped by the grounding area of cable clamp 8.

    d. Install the cable clamp screw from below **5** into cable clamps 8.
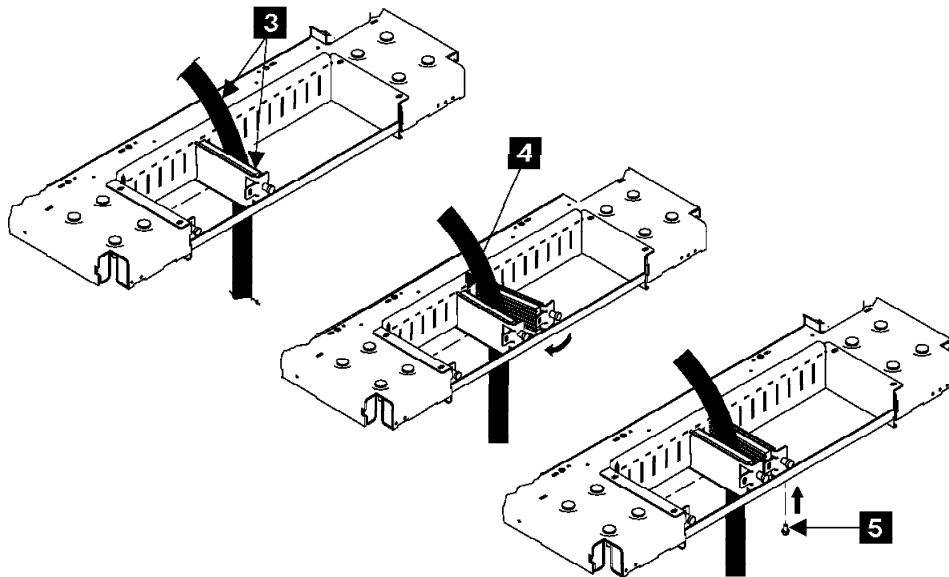
Figure 122. 2105 Model 100 Front and Rear Tailgate Cable and Cable Clamp Installation (t007467m

    e. Repeat the above steps on cable clamp 8 in the other tailgate if required.

___ 4. Continue with "Tailgate EMC Hardware Installation".

Tailgate EMC Hardware Installation

Use Figure 123 on page 137 for this procedure, drawings may not match hardware.

___ 1. Install the EMC plate bracket with the attached EMC plates into the tailgate. Ensure that the tabs on the rear of the EMC plates **2** seat into the slots **1** at the rear of the tailgate.

___ 2. Install the two screws **5** and **3** for the EMC plate bracket **4** .

___ 3. Install the mainline power cable EMC plate **7** then install the two plate mounting screws **10** .

___ 4. Position the mainline power cable so its exposed metal shielding **9** is positioned for the cable clamp **8** to contact it.

___ 5. Install the mainline power cable clamp **8** then install the two clamp mounting screws **11** .

       Note: The cable clamp must seat against the exposed metal shielding of the mainline power cable.

__ 6. Return to the procedure that sent you here.
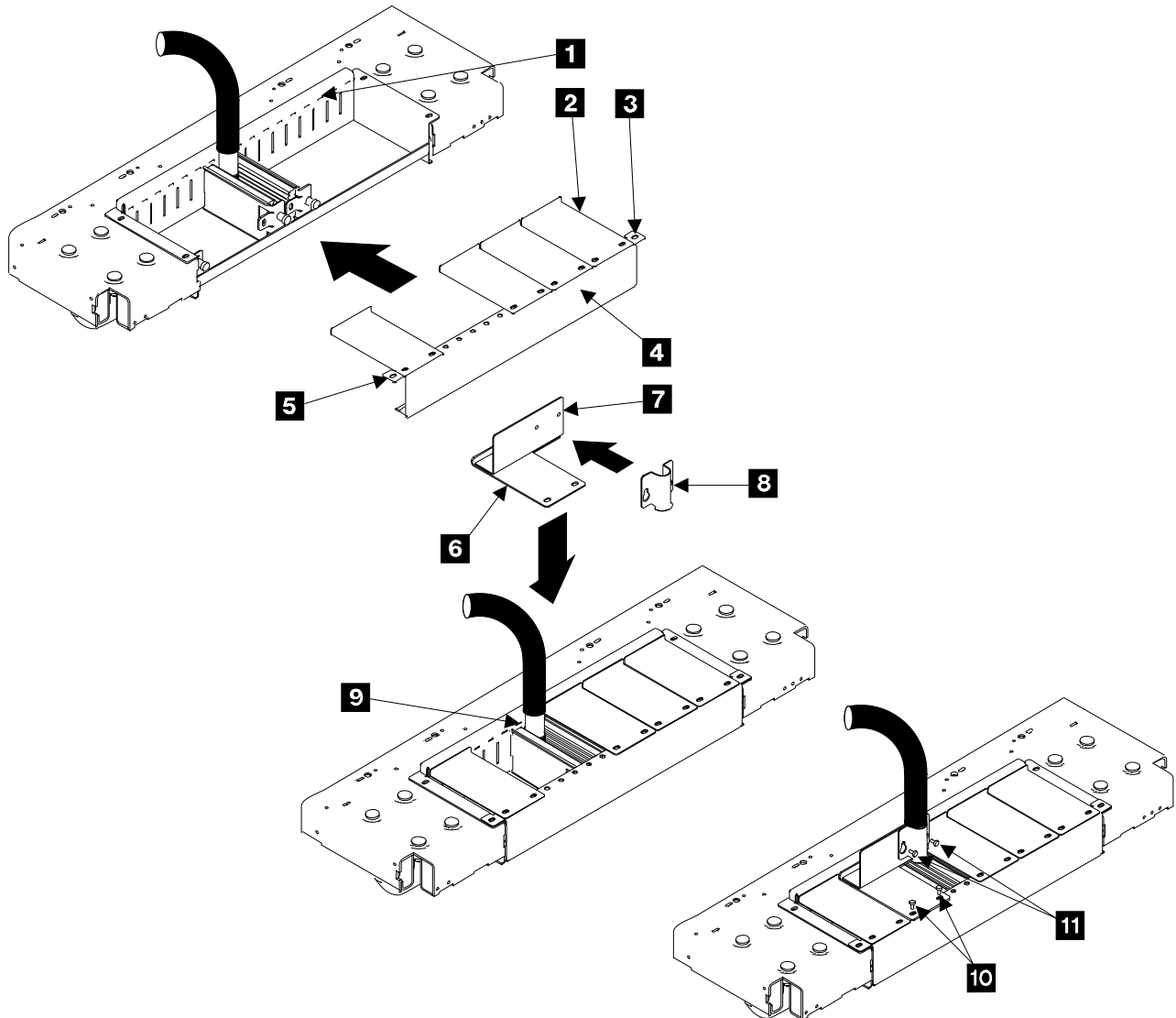
Figure 123. Tailgate EMC Hardware Installation (t007493q)

Physically Installing a 7133 Device Drawer

Attention: This procedure can be performed concurrent with customer operation, and is *not* a stand-alone procedure.

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

These instructions describe how to:

*   Determine prerequisites for installing 7133 device drawers
*   Physically install a 7133 Model 020 or 040 drawer into a 2105 Model 100 rack
*   Connect a 7133 to the rack power source

These instructions assume that you have access to:

Installing a 7133 Device Drawer

- Preinstallation planning information for the system.
- The procedure *7133 Model 020 and 040 Requirements for 2105 Installations*, is available. This Service Offering procedure will ensure that previously used 7133s are compatible with the ESS subsystem, refer to the *2105 IBM Versatile Storage Server Introduction and Planning Guide* book, form number GC26-7223.

   Note: This procedure is a *billable service* for each 7133 and should be completed prior to installation.

- The subsystem configuration information from the Configuration Worksheets found in the *IBM Enterprise Storage Server Configuration Planner* book, form number GC26-7353.

Prerequisites to Installing 7133 Device Drawers

- The customer has filled out the necessary logical configuration information in the Configuration Worksheets for the 7133 device drawers being added to the ESS subsystem (refer to worksheets in the *IBM Enterprise Storage Server Configuration Planner* book, form number GC26-7353.
- The 7133 Model 020 and 040 device drawers being added to the ESS subsystem have:
  - All arrays must be removed using the **Remove Device Drawer** procedure from their previously installed ESS subsystem.

    Attention: Failure to properly remove arrays prior to attempting installation in an ESS subsystem will result in the failure of the **Install 7133 Device Drawer** option and require the aid of next level of support.

  - All 7133 device drawers must be checked for compatibility before being added to an ESS subsystem. Use the **7133 Model 020 and 040 Requirements for 2105 Installations** service offering instructions provided in the *IBM Enterprise Storage Server Introduction and Planning Guide* book, form number GC26-7294. The compatibility procedure provides detail instructions to ensure that:

    1. Only 7133 Model 020 and 040 device drawers can be attached to an ESS subsystem.
    2. Only six 7133 device drawers can be installed in a 2105 Model 100 rack, twelve in two 2105 Model 100 racks.
    3. Dummy DDMs or open slots are not allowed (DDMs must be installed in all 16 DDM slots).
    4. 7133 Model 020 and 040 device drawers can not be intermixed on the same SSA Loop.
    5. All DDMs in each drawer on the same loop must be the same capacity (4.5 or 9.1 GB on a 7133 Model 020 and 4.5, 9.1, 18.2, or 36.4 GB on a 7133 Model 040).
    6. All 7133 device drawers have their front covers and DDM locks removed.
    7. Only 220v power supplies are installed.
    8. That the proper drawer bypass-cards are installed using ECA 005.
    9. That the bypass-cards have jumpers installed correctly.
    10. That the model and serial number information is transferred from the label on the front cover that was removed, to a new blank label on the front of the 7133.

Installing a SSA DASD Drawer into a Rack

Attention: 7133 drawers are only installed in 2105 Model 100 rack positions Y0 to Y5, position Y6 is not used.

Place a check mark next to each completed step.

___ 1. Are the correct rails already installed for the drawer being added?

> **Note:** New 2105 Model 100s come from manufacturing with 7133 Model 040 rails.
>
> - **Yes**, remove the front drawer cover plate, see step 8 on page 141.
>   Then go to "Removing the Disk Drive Modules" on page 144.
> - **No**, continue with the next step.

___ 2. To install a 7133 Model 020 drawer, replace the hold down bracket **15** in Figure 129 on page 143, with rear clamp plates **6** in Figure 124 on page 140.

> **Note:** The 7133 Model 020 drawer rear clamp plates, P/N 51H8804, are in the ship group for FC 1121.

___ 3. A detailed list of items is shipped with the 7133 Model 020 drawer. Ensure that you have all the items that are shown on the list. Refer to the diagram below to identify the items.

> **Note:** For 7133 Model 040 drawers, see "SSA DASD Drawer Components Physical Location Codes, Model 040 Drawer" on page 186.
>
> **1** Front mounting screws, lock washers, and flat washers
> **2** Nut clips
> **3** Support rail, left
> **4** Rail screws
> **5** Rear mounting screws and washers
> **6** Rear clamp plates (Model 020 drawer only)
> **7** Support rail, right
> **8** SSA device cables (two cables)
> **9** Disk drive module locks (optional)

Installing a 7133 Device Drawer
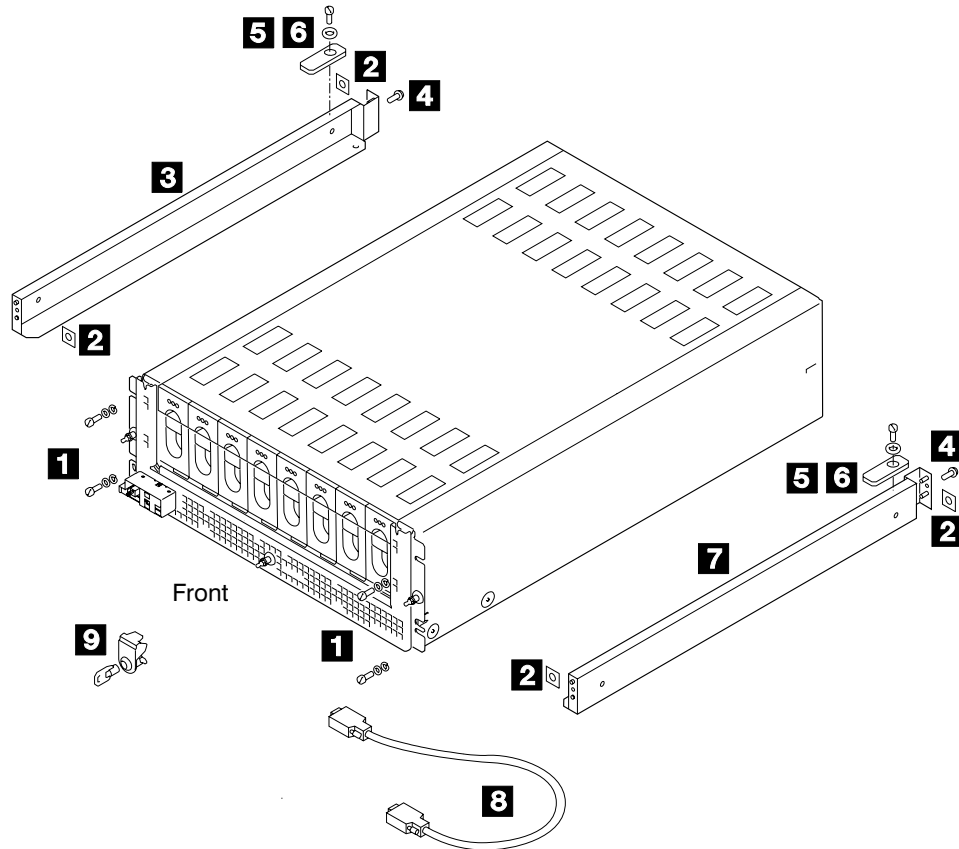
Figure 124. SSA DASD Drawer Installation Parts, Model 020 Drawer (t007191n)

__ 4. Find the two support rails **10** that are supplied with the 7133

Determine if you are installing a SSA DASD Model 020 or 040 drawer drawer:

- SSA DASD Model 020 drawer, go to step 5.
- SSA DASD Model 040 drawer, go to step 7 on page 141.

__ 5. Onto each support rail, install a clamp plate **11** , washer **12** (may not be installed), and screw **13** . Ensure that the clamp plates are oriented as shown in the diagram.
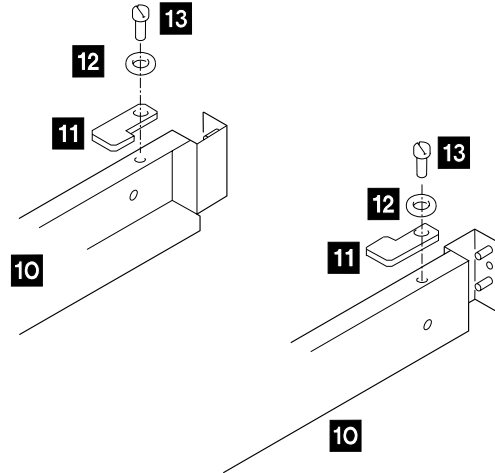
Figure 125. 7133 Model 020 Support Rail Installation (t007192m)

__ 6. Tighten the screws just enough to prevent the clamp plates from moving.

__ 7. Using the preinstallation planning information, or other relevant information, determine where you are going to locate the 7133 in the rack. The 7133 is four Electronics Industries Association (EIA) units high.

Attention Unless the customer has special requirements, install the drawer in the lowest available location in the rack.

Ask the customer if he wants the new drawer installed in a specific location in the rack. Install the new drawer in the lowest available location or the location specified by the customer.

__ 8. At the front of the rack, remove the drawer cover plate from the new drawer location. Remove the two screws `14` and `16` , then remove the drawer cover plate `15` from the rack.
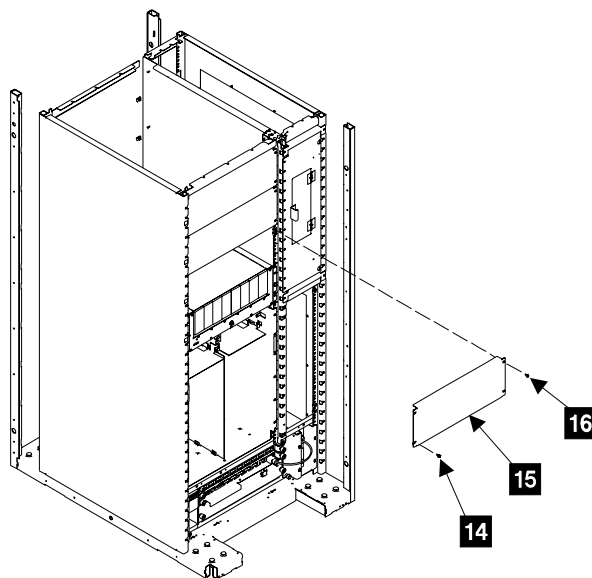
Figure 126. Drawer Cover Plate Removal (t007193m)

Installing a 7133 Device Drawer

__ 9. Refer to the EIA markings on the rack and decide where you are going to install the support rails. If appropriate, allow for possible future installation of other drawers.

> **Note:** 2105 Model 100 device drawer 6 (Y6) is not used when attached to an ESS, see "SSA DASD Drawer Physical Location Codes" on page 183.

__ 10. For each support rail:

a. Attach a nut clip **20** at the selected hole in the rear of the rack.

b. Insert the two studs **18** and **21** of the support rail into the rear of the rack. Hold the support rail so that it is horizontal, and push it forward so that the stud **17** enters the matching hole in the front of the rack.

c. Check whether the support rail is horizontal by using the EIA markings on the front and rear of the rack. If the rail is not horizontal, remove it from the rack, then repeat step 10b.

d. Insert the rail screw **19** into the nut clip **20** and tighten it.
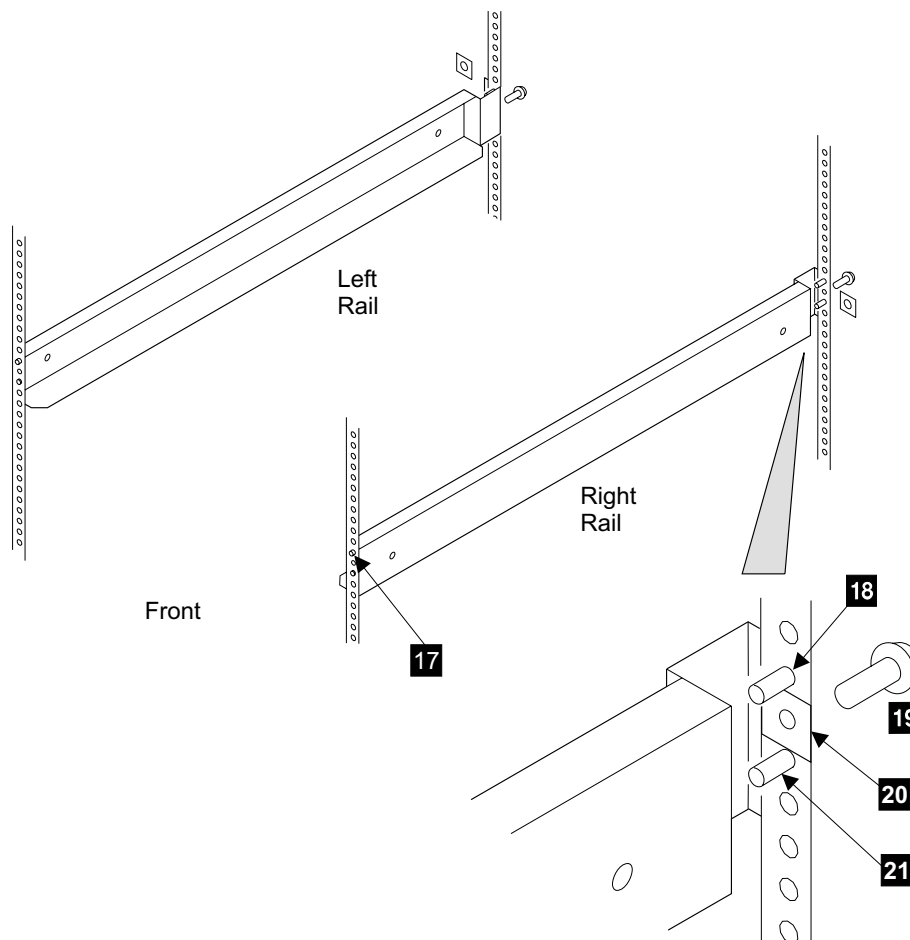
Figure 127. Drawer Support Rail Installation (t007194p)

__ 11. At the front of the rack, observe the threaded hole **22** in each of the support rails that you have just installed.

__ 12. Count seven holes upward from each threaded hole, and install a nut clip
23 .
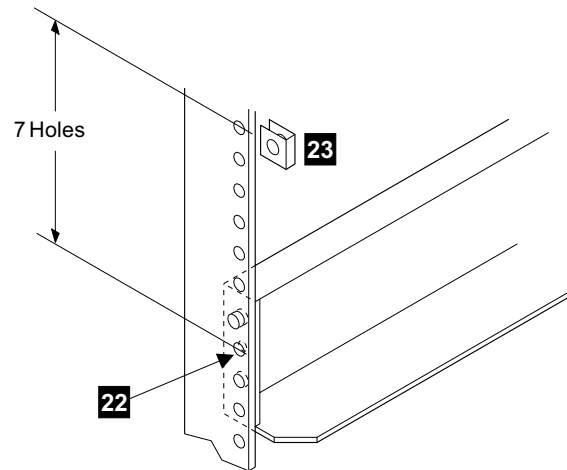
Figure 128. Drawer Support Rail Installation (t007195m)

__ 13. Determine if you are installing a SSA DASD Model 020 or 040 drawer
drawer:

- SSA DASD Model 020 drawer, go to step "Removing the Disk Drive
  Modules" on page 144.
- SSA DASD Model 040 drawer, go to step 14.

__ 14. SSA DASD Model 040 drawers only, install the right and left drawer hold
down brackets:

a. Place each bracket **24** , on the rail **27** , and install the two mounting
   screws **25** into each bracket.
b. Push each bracket up and tighten enough to hold the bracket.
c. Install the third screw **26** into each bracket and tighten until it just
   touches the bracket.

Rear View
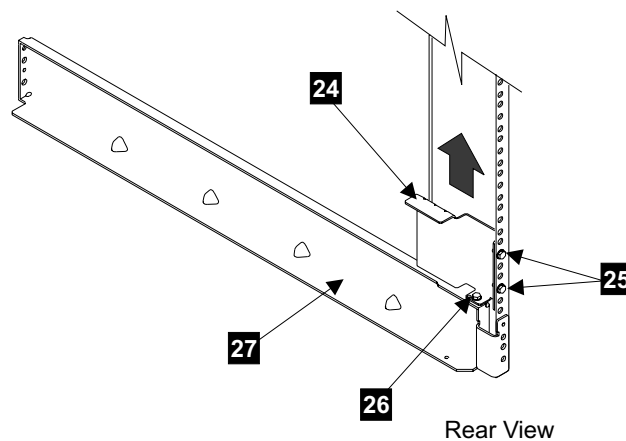
Figure 129. SSA DASD Model 040 Drawer Hold Down Bracket Installation (t007662m)

__ 15. Go to "Removing the Disk Drive Modules" on page 144.

Removing the Disk Drive Modules

Attention: Disk drive modules are fragile. Handle them with care, and keep them well away from strong magnetic fields.

CAUTION:

An SSA DASD drawer weighs up to 50.0 kg (110 lb) with disk drive modules installed. Do not attempt to lift the SSA DASD drawer into the rack unless all the disk drive modules have been removed. (1057)

__ 1. Before you start to remove any modules, carefully make a note of the locations of each disk drive module (DDM) that are in the Model 040 drawer. This will aid in the reinstall of the DDMs into their original slots. Attach identifying labels to the DDMs.

>   **Note:** Disk drive modules have a serial-number label:
>   - Model 020 drawer, **1**
>   - Model 040 drawer, **2**
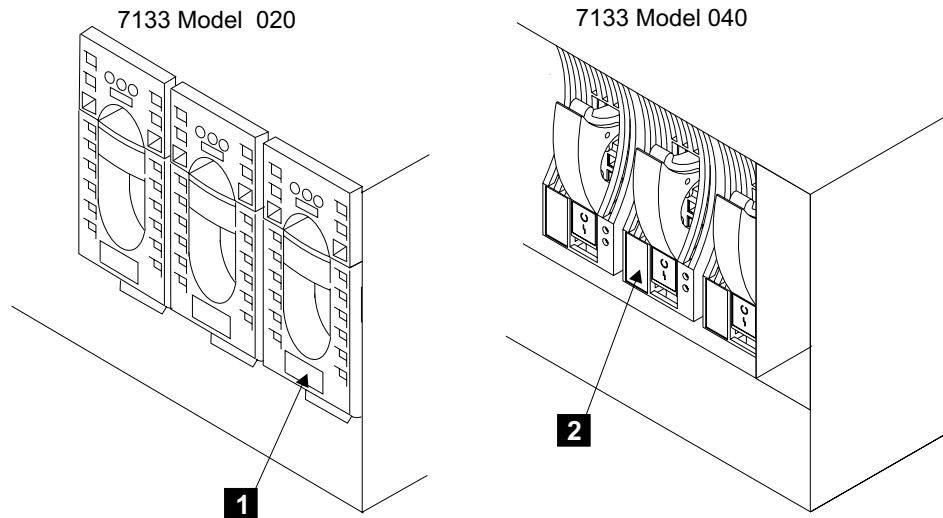
Figure 130. Disk Drive Module Identification (t008858m)

__ 2. If the disk drive modules have locks, ask the customer for the key:
   - Model 020 drawer, **3**
   - Model 040 drawer, **4**
__ 3. Insert the key into the lock, turn it counterclockwise, and remove the lock.

7133 Model 020   7133 Model 040
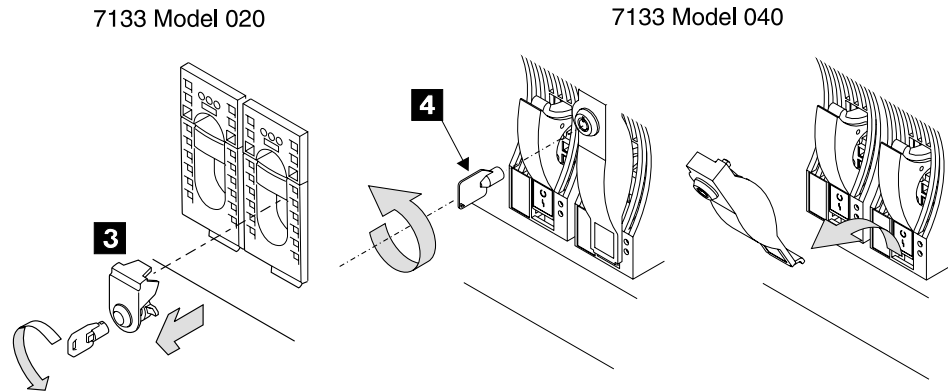
Figure 131. Disk Drive Module Lock Removal (s007708m)

__ 4. Open the DDM handle:
- Model 020 drawer, press upward behind the red panel **5** , and pull the handle down **6** . This action pulls the disk drive module partly out of its slot.
- Model 040 drawer, press the blue latch **7** , and pull the handle down **8** . This action pulls the disk drive module partly out of its slot.

7133 Model 020   7133 Model 040
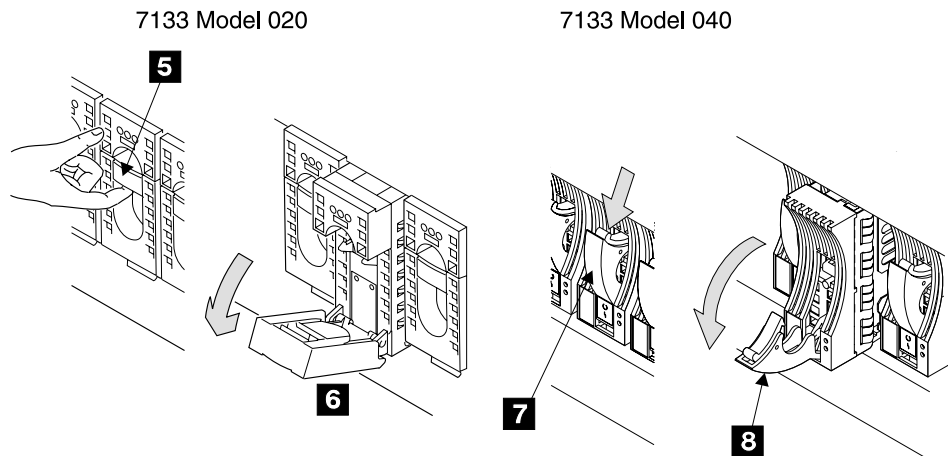
Figure 132. Disk Drive Module Removal (s007709m)

__ 5. Carefully pull out the disk drive module. As the module comes out, put one hand under its base to prevent it from falling.

Installing a 7133 Device Drawer

7133 Model 020   7133 Model 040
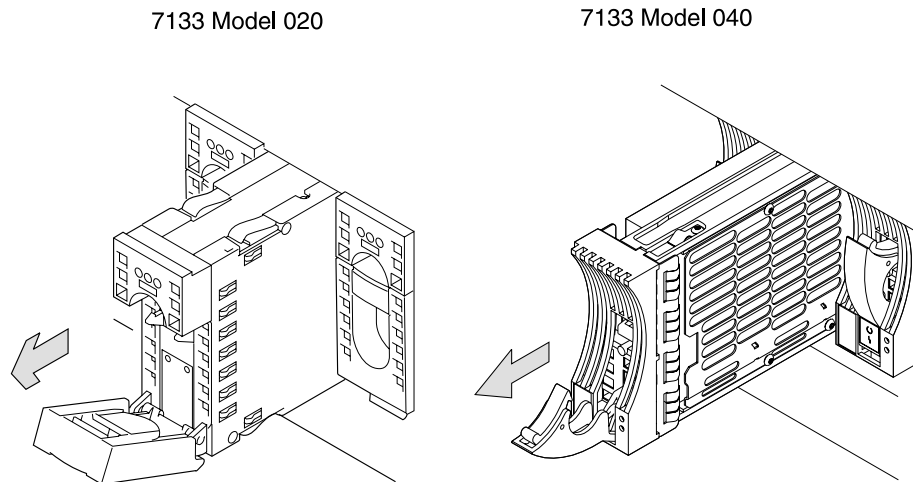
Figure 133. Disk Drive Module Removal (s007710m)

__ 6. 7133 Model 040 DDMs only, lay the DDMs down so they rest on their supports **9**.
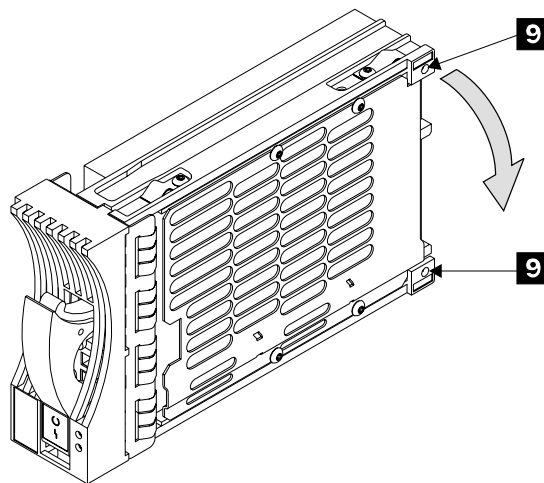
Figure 134. SSA DASD Model 040, Placing a DDM in a Safe Position (t007569m)

__ 7. Repeat steps 2 through 6 for each disk drive module. Ensure that you remove all the modules from the front and rear of the 7133.

Installing the 7133 into a Rack

If you have not already done so, remove all the disk drive modules from the 7133, see "Removing the Disk Drive Modules" on page 144.

CAUTION:

An SSA DASD drawer weighs up to 50.0 kg (110 lb) with disk drive modules installed. Do not attempt to lift the SSA DASD drawer into the rack unless all the disk drive modules have been removed. (1057)

__ 1. Read the following Caution notice before continuing.

CAUTION:

This unit weighs between 18 kg (39.7 pounds) and 32 kg (70.5 pounds). Two persons are required to safely move it. Using less than two persons to move it can result in injury. (1054)

Stand at the front of the rack and, with aid from another person, place the rear of the 7133 onto the support rails, then slide the 7133 into the rack.

__ 2. Install the four front mounting screws **1** with their lock washers **2** and flat washers **3** . Do not fully tighten the screws yet.

Note SSA DASD Model 020 drawer shown.
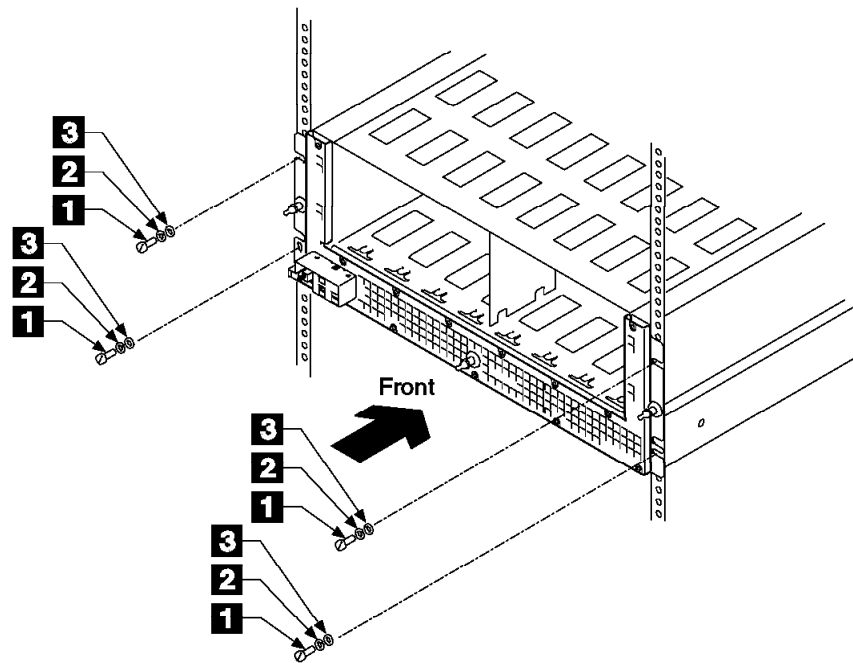
Figure 135. Support Rail Installation (t007200n)

__ 3. Determine if you are installing a SSA DASD Model 020 or 040 drawer drawer:

- SSA DASD Model 020 drawer, go to step 4.
- SSA DASD Model 040 drawer, go to step 8 on page 148.

__ 4. At the rear of the rack, loosen the two screws **5** , and turn the two clamp plates **4** inward so that they engage the slots in the sides of the 7133.

Note SSA DASD Model 020 drawer shown.

__ 5. Tighten the two screws **5** .

Installing a 7133 Device Drawer
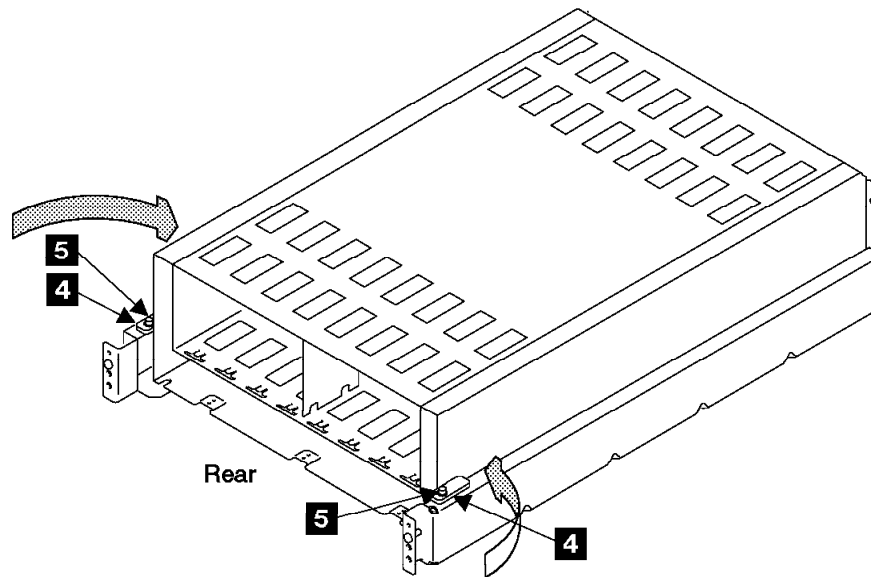
Figure 136. Support Rail Installation (t007201m)

__ 6. Fully tighten the four front mounting screws **1**, see Figure 135 on page 147
.
__ 7. Go to "Reinstalling the Disk Drive Modules".
__ 8. SSA DASD Model 040 drawers only, tighten the right and left drawer hold
down brackets:

   a. Loosen the three drawer hold down bracket mounting screws **7** and
   8 on each bracket.
   b. Press down on each drawer hold down bracket **6** then tighten the three
   bracket mounting screws.
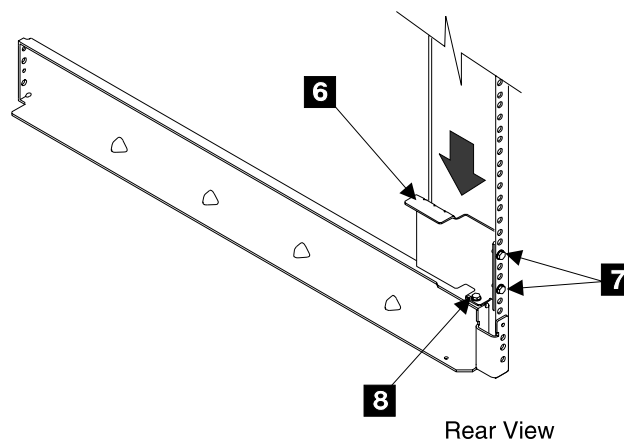
Figure 137. SSA DASD Model 040 Drawer Hold Down Bracket Installation (t007663m)

__ 9. Go to "Reinstalling the Disk Drive Modules".

Reinstalling the Disk Drive Modules

Attention: Disk drive modules are fragile. Handle them with care, and keep them
well away from strong magnetic fields.

__ 1. Referring to the note that you made about the original locations of the modules, reinstall the modules as described in the following steps.

__ 2. Open the DDM handle before installation:

- Model 020 drawer, press upward behind the red panel **1**, and pull the handle down **2**.
- Model 040 drawer, press the blue latch **3**, and pull the handle down **4**

7133 Model 020   7133 Model 040
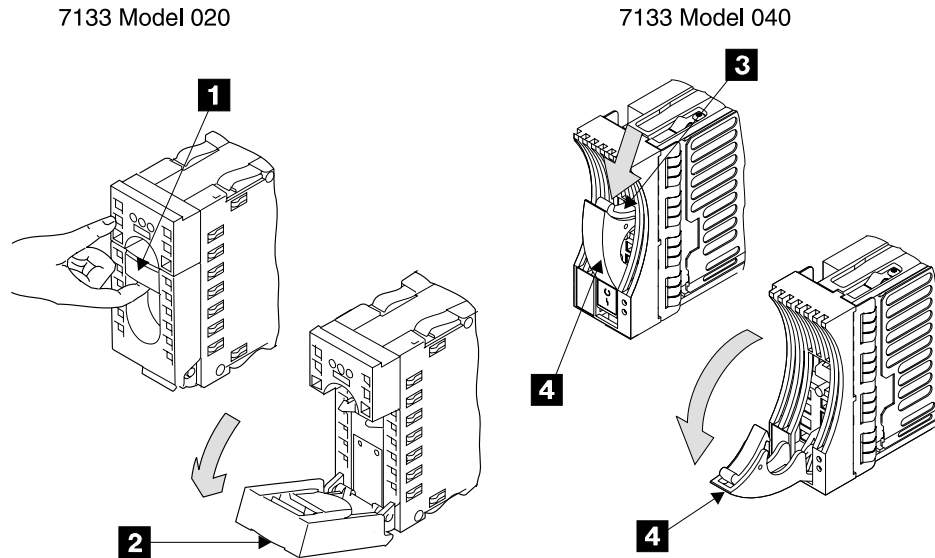
Figure 138. Disk Drive Module Installation (s007711m)

__ 3. With one hand under the drive, align the drive with the groove, and push it into its slot:

- Model 020 drawer, **5**
- Model 040 drawer, **6**

The drive stops before it is fully seated.

7133 Model 020   7133 Model 040
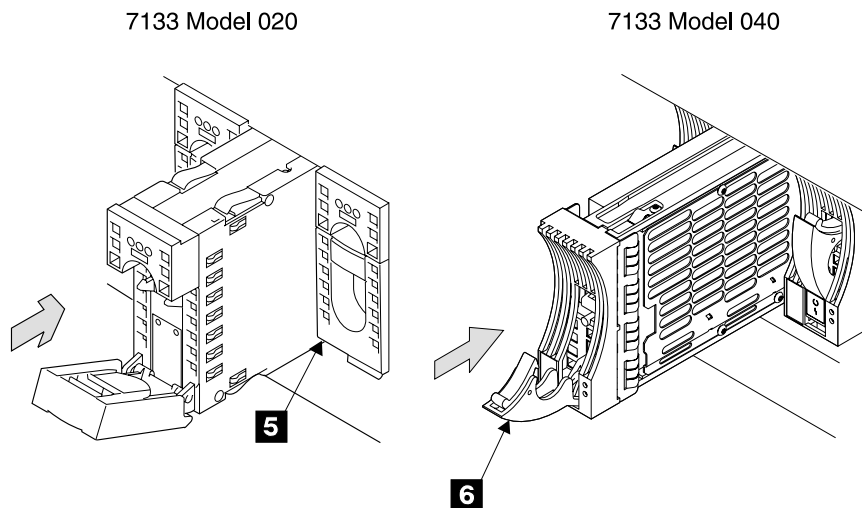
Figure 139. Drive Module Installation (s007712m)

__ 4. Push the disk drive modules handle up until it latches closed:

Installing a 7133 Device Drawer

- Model 020 drawer, **7**
- Model 040 drawer, **8**

7133 Model 020   7133 Model 040
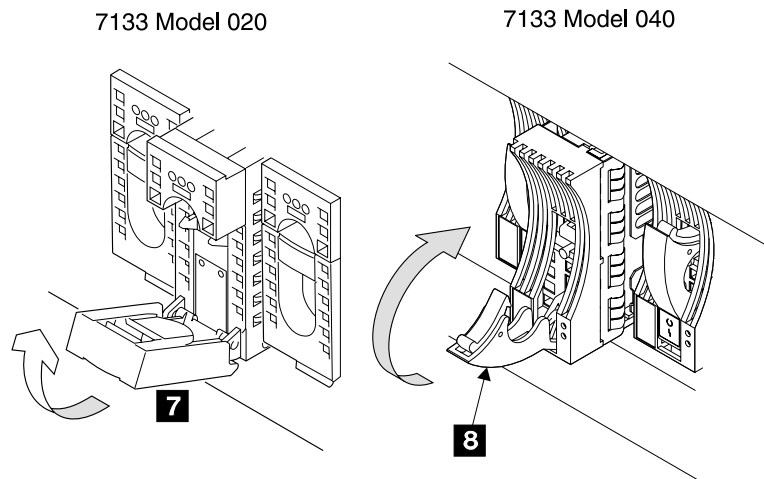
Figure 140. Drive Lock Installation (s007713m)

__ 5. Verify that the front of the drive module is aligned with the other drives.

__ 6. **Attention:** Ensure that the 7133 has no empty slots.

   Notes:

   a. Any 7133 attached to a 2105 Model Exx/Fxx must have all 16 DDMs installed. Dummy DDMs are not supported.

   b. The DDM position numbers are stamped into the edge of the metal shelf that the front of the DDMs rest on.

__ 7. Continue with "Connecting the 7133 Drawer to the Power Source".

Connecting the 7133 Drawer to the Power Source

__ 1. Go to the rear of the 7133 drawer:

- Model 020 drawer, the 7133 has three fan-and-power-supply assemblies:
   - Connect a one-way power cable to the left **1**, and right **3**, fan-and-power-supply assemblies.
   - Connect the plug of the two-way power cable to the center fan-and-power-supply assembly **2**.

- Model 040 drawer, the 7133 has two power supply assemblies:
   a. Switch off both power supply assemblies. Pull each PWR/FAULT RESET switch **5** then **7** out and push it down.
   b. Connect the left one-way power cable to the left **4**, power supply assembly.
   c. Connect the plug of the two-way power cable to the right power supply assembly **6**. The right power cable **8** is not used with Model 040 drawer drawers.

7133 Model 020
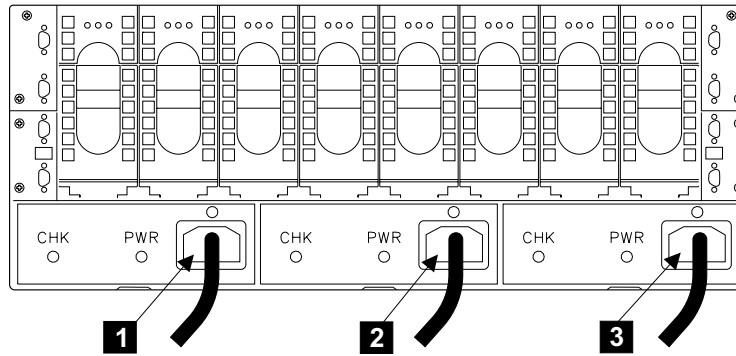
Rear View

7133 Model 040
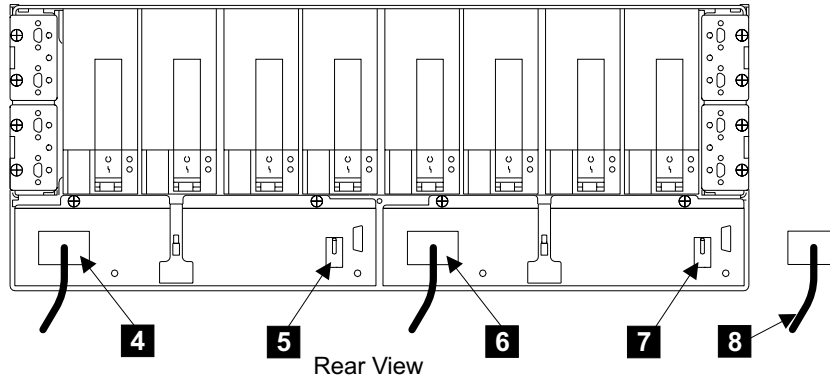
Rear View

Figure 141. Fan-and-Power-Supply Power Cables (t008859p)

__ 2. **Attention:** Take the correct **Yes** or **No** step out of this procedure.

Do you have any additional SSA DASD drawers to physically install?

- **Yes**, Go to "Physically Installing a 7133 Device Drawer" on page 137.
- **No**, Go to "How to Power on the 2105 Model 100 and Test the Installation" on page 118.

Logically Installing the 7133 Device Drawers

This procedure will:

- Develop 7133 configuration information for adding drawers to loops when the customer has chosen not to provide the necessary information.
- Logically add 7133 device drawers, either individual or multiple, on SSA loops.
- Provide service terminal guidance when installing SSA cables.

__ 1. Determine if the customer has provided the necessary configuration information, such as drawer and loop assignments, for the 7133 drawers being added. This information should be in the Configuration Worksheets.

__ 2. Is the drawer and loop assignment information available for the 7133 drawers being added?

- **Yes**, go to "Installation with Configuration Information Available" on page 154.
- **No**, continue with "Installation Without Configuration Worksheets" on page 152.

Installing a 7133 Device Drawer

Installation Without Configuration Worksheets

If the customer has not provided the necessary configuration information with the Configuration Worksheets, such as 7133 drawer and loop information, then the following procedure can be used. It will guide a service representative through several service terminal screens to gather information and then provide tables where the information can be filled in. The tables will help in determining allowable drawer and loop assignments that should be entered during the logical installation of 7133 drawers to provide the best performance.

__ 1. Determine available loops where 7133 drawers can be added.

From the service terminal **Main Service Menu**, select:

> **Configurations Options Menu**
>> **Show Storage Facilities Resources Menu**
>>> **List Device Drawers on an SSA Loop**

__ 2. Select each loop color, one at a time, and in the Table 16 on page 153, record the following information:

- The 7133 Model number (Model 20 or 40) of currently installed 7133 drawers in the column titled **7133 Model (020/040)**

  Note: Write ″Bay″ in the **7133 Model (020/040)** column for those loops which already have DDM Bays installed.

- the number of DDM Bays and 7133 drawers currently installed on each loop in the column titled **Number of Drawers on Current Loop**

- When finished recording information for one loop, press **F3**, select **List Device Drawers on an SSA Loop**, and then the next color loop. Continue to the next step only when all color loop information has been recorded.

__ 3. Determine the number of drawers that can be added to each loop and record that information in the column titled **Number of Drawers that can be Added** in Table 16 on page 153.

- Loops that currently have DDM Bays installed can not be inter-mixed with 7133 drawers. Enter the number 0.

- Loops that currently have 7133 drawers installed, enter the number of 7133 drawers that can be added to the loop (for example 0, 1 or 2).

  Note: The maximum number of drawers on a loop is 3.

- Loops that have no drawers installed, enter the number 3.

__ 4. Determine the DDM resource capacity of the 7133 drawers currently installed on each loop and enter that number in the column titled **Resource Capacity** in Table 16 on page 153.

- Press F3 and return to the **Show Storage Facilities Resources Menu** and select:

  List DDMs on an SSA Loop

- Select each loop that has 7133 drawers currently installed and record the **Resource Capacity (GB)** for each loop.

  Note: When drawers are added to an existing loop, they must have the same resource capacity (GB) as those that are currently installed.

Table 16. Loop Availability

Loop Name (Color)	7133 Model (020/040)	Number of Drawers on Current Loop	Number of Drawers that can be Added	Resource Capacity (GB)	Resource Location of Drawers to Add
Blue					
Brown					
Gray					
Green					
Orange					
Red					
Violet					
Yellow					

__ 5. Ensure that all the fields (except the last column) have been filled in Table 16, before proceeding to the next step.

__ 6. Go to the rear of each 2105 Model 100 that holds 7133 drawers. The drawers that are being added are those without SSA cables attached to them. Record the following information in Table 17 for each drawer being added to the 2105 Exx/Fxx subsystem:

- **Drawer Physical Location (Rx-Yx)**, refer to "SSA DASD Drawer Physical Location Codes" on page 183.
- **7133 Model (020/040)**, refer to Figure 142 on page 154.
- **7133 Drawer Serial Number**.
- **DDM Resource Capacity (GB)**, refer to Figure 130 on page 144.

Table 17. Drawers to be Added

Drawer Physical Location (Rx-Yx)	7133 Model (020/040)	Drawer Serial Number	DDM Resource Capacity (GB)	Install Loop Name (Color)

__ 7. Determine which drawers can be added to each loop using the following rules and then add each drawer to the two previous tables; where the Physical Location gets added to the **Resource Location of Drawers to Add** column and the loop color gets added to the **Install Loop Name** column.

- All 7133s on any SSA Loop must be the same model (020 or 040)

Installing a 7133 Device Drawer

- All DDMs on any SSA Loop must be the same DDM Capacity
- There can only be a maximum of three 7133s on any SSA Loop
- There can only be a maximum of twelve (12) 7133s added to an ESS subsystem
- Start adding 7133s to the current loop that has the least 7133s
- If there are more 7133s available than the available loops will allow, add largest capacity 7133s first

__ 8. Using the information in Table 16 on page 153 and Table 17 on page 153, continue with "Installation with Configuration Information Available".

Installation with Configuration Information Available

__ 1. From the service terminal **Main Service Menu**, select:

> **Install/Remove Menu**
>> **Device Drawer (DDM Bay or 7133 Drawer) Menu**
>>> **Install a Single Device Drawer** or
>>> **Install Multiple Device Drawers**
>>> The service terminal will logically add the SSA DASD drawers and then direct you back to this procedure.

>>> **Note:** Steps a, b, and c has information to help you through the service terminal screens.

a. Go to the front of the SSA DASD drawer and locate and record the SSA DASD drawer machine-type and serial number label:

- Model 020 drawer, **1**
- Model 040 drawer, **2**

7133 Model 020   7133 Model 040

Front View   **1**   Front View   **2**
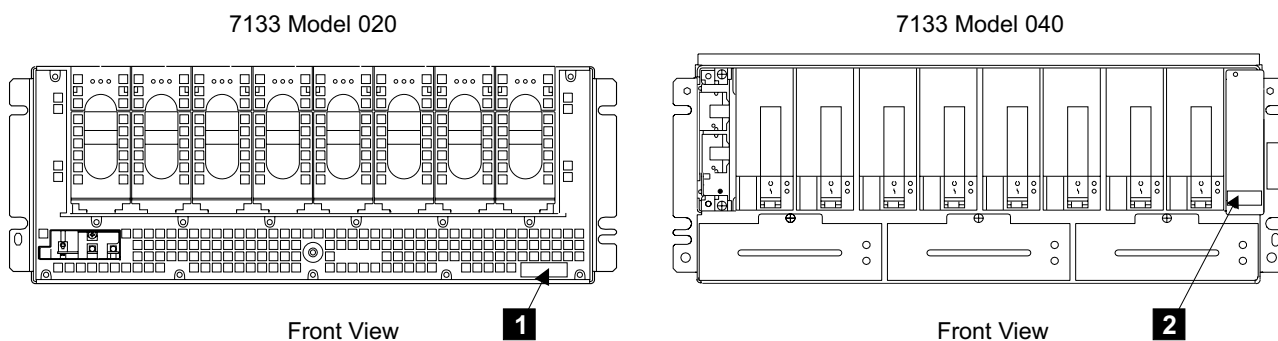
Figure 142. SSA DASD Drawer Machine-Type and Serial Number Label (t008860l)

b. Using the either the single or multiple drawer option and the customer supplied configuration worksheets, begin adding 7133 drawers.

From the service terminal **Main Service Menu**, select:

> **Install/Remove Menu**
>> **Device Drawer (DDM Bay or 7133 Drawer) Menu**
>>> **Install a Single Device Drawer** or
>>> **Install Multiple Device Drawers**
>>>> 1) With **Install a Single Device Drawer**, a drawer can be installed non-disruptive (concurrent loop install) when there

                       are drawers already installed on a loop. This process is slower, but doesn't interrupt customer access to drawers currently on the loop.

    2) With **Install Multiple Device Drawers**, multiple drawers can be installed disruptively (disruptive loop install) when there are drawers already on a loop. This process is faster, but requires that the customer give up access to drawers currently on the loop.

    3) When single or multiple device drawers are installed on an empty loop, the **Install Multiple Device Drawers** option should always be used (its faster).

c. Follow the service terminal guided procedure. The following is help text for screens that will be displayed in these two options:

- The **Select a Device Drawer** screen displays any drawers not fully installed (normally due to delaying formatting) and a new drawer option. Select New Drawer.

- At the **Select Device Drawer Type** screen, use F4 to display and select the 7133 device drawer.

- At the **Select an SSA Loop** screen, select the SSA loop with the appropriate location code and Loop. Each loop has two location codes, one for each end of the loop:

    1) **SSA device card, R1-Tx-P2-Kx:**
  - R1=Rack 1
  - Tx=Cluster Bay X
  - P2=I/O Planar
  - Kx=I/O Planar slot for SSA card
  - yy=cable connector, A1, A2, B1, or B2

    2) **SSA device card connectors, loop A or B:**
  - A=A1/A2 connectors
  - B=B1/B2 connectors

- At the **Drawer Information Options** screen, use F4 to list and select the Drawer Location.

Installing a 7133 Device Drawer
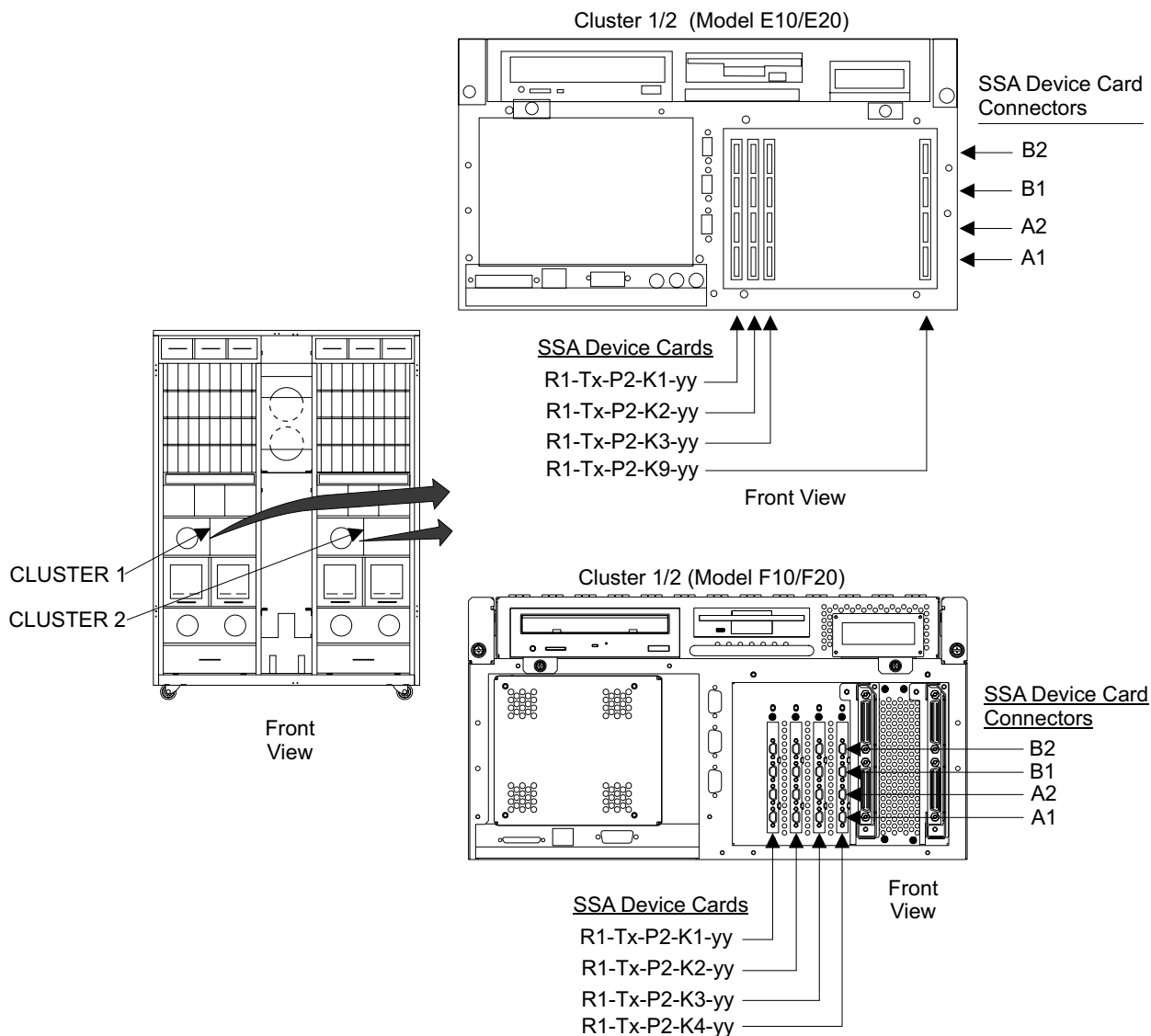
Figure 143. Cluster Bay SSA Device Card Connector Locations (S008801q)

__ 2. Continue with "Continuing the Installation of the 7133 Device Drawer"

Continuing the Installation of the 7133 Device Drawer

Attention: The logic cards the SSA cables connect to in this procedure are ESD-sensitive. Always wear an ESD wrist strap during this procedure. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: If the service terminal has directed you to this procedure, the logical drawer selection has been completed. Use the service terminal and the following instructions to connect the SSA cables.

__ 1. The SSA connectors at the rear of the 7133 Model 020/040 drawer are mounted on four bypass cards. These bypass cards can operate in Bypass mode or in Forced Inline mode. The mode in which the card operates is set by two jumper settings. The default setting is for Bypass mode, SSA DASD drawers operating in a 2105 rack are always set to Bypass mode.

Note: If the settings of the bypass jumpers are not known (for example, this is a field transfer), refer to Figure 33 on page 55, Figure 34 on page 56, and Figure 35 on page 57 to correct the jumper settings.

__ 2. The **Install SSA Cables** screen has directed you back here for additional information. The screen lists the SSA locations and three actions needed to connect the new DDM bays into the SSA loop.

a. **The following cable location(s) need to be disconnected.**

Disconnect both ends of each cable. Do not remove the cable yet, as it may be used below as a new cable.

b. **The following cable location(s) are new. Please add or move cables to the appropriate locations.**

- The SSA cables are ordered and supplied with FC 1121 or FC 1122.

  Attention: When routing the new SSA cables, avoid making sharp (90 degree) bends that might damage the cables or connectors. Follow the routing and bends used on previously installed SSA cables. For examples, see SSA cables installed by manufacturing.

- Route the new SSA cables between the indicated SSA device cards in the 2105 Model Exx/Fxx and the 7133 drawer being installed.

- Route the SSA cables down through the front and rear tailgates and clamping hardware.

- Use the colored loop tape, P/N 34L8551 supplied with FC 1121, to label **each** end of **each** SSA cable as it is installed.

  Notes:

  1) These colored labels aid in the quick identification of all drawers and connectors in the individual SSA loops.

  2) To prevent damage to the SSA device cable connector screws, always use the special screwdriver (SSA tool, P/N 32H7059) to turn them. This screwdriver is in the 2105 ship group.

  3) The SSA DASD drawer and SSA card indicators will come on and off as cables are connected and disconnected. The state of these indicators should be ignored until they are tested later in the install procedure.

c. **The following cable location(s) remain the same.**

These SSA cables are already installed and will stay connected to the existing locations. These cables and the list of new cables above are all cables on this SSA loop.

Installing a 7133 Device Drawer

SSA DASD Drawer Models 020/040 (Rx-Yx-Jxx)

Rear View
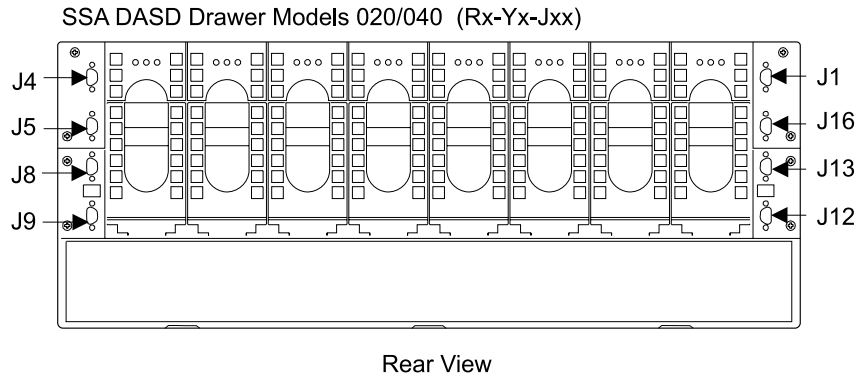
Figure 144. 7133 SSA Connector Locations (S007651I)

    __ 3. After all of the SSA cables have been installed, locate the SSA device cable identification labels. These labels, P/N 34L8550, are supplied in the FC 1121 ship group.

    __ 4. Attach a label to **each** SSA cable that connects to an SSA device card in each cluster bay. The label only needs to list the SSA device card connector, A1, A2, B1, or B2, the cable is plugged into.

    __ 5. Attach a label to **each** SSA cable that connects to a 7133 drawer. The label only needs to list the drawer *Jx* connector that the SSA cable plugs into. Refer to Figure 144.

    __ 6. Go to "Turning On and Testing the 7133".

Turning On and Testing the 7133

    __ 1. Determine if you are installing a SSA DASD Model 020 or 040 drawer drawer:

        • Model 020 drawer, go to step 2.

        • Model 040 drawer, go to step 7 on page 160.

    __ 2. Check if the SSA DASD drawer Subsystem Power indicator is on **5** Figure 145.

        • If it is on, go to step 5 on page 159.

        • If it is not on, go to step 3.

    __ 3. Attempt to power on the drawer manually, on Model 020, press and release the 7133 power switch **4** .

    __ 4. Observe the SSA DASD drawer Subsystem Power indicator **5**

        • If the SSA DASD drawer Subsystem Power indicator comes on, go to step 5 on page 159.

        • If the Subsystem Power indicator still does not come on, go to go to MAP 3151 in chapter 3 of the 2105 Model Exx/Fxx Service Guide.
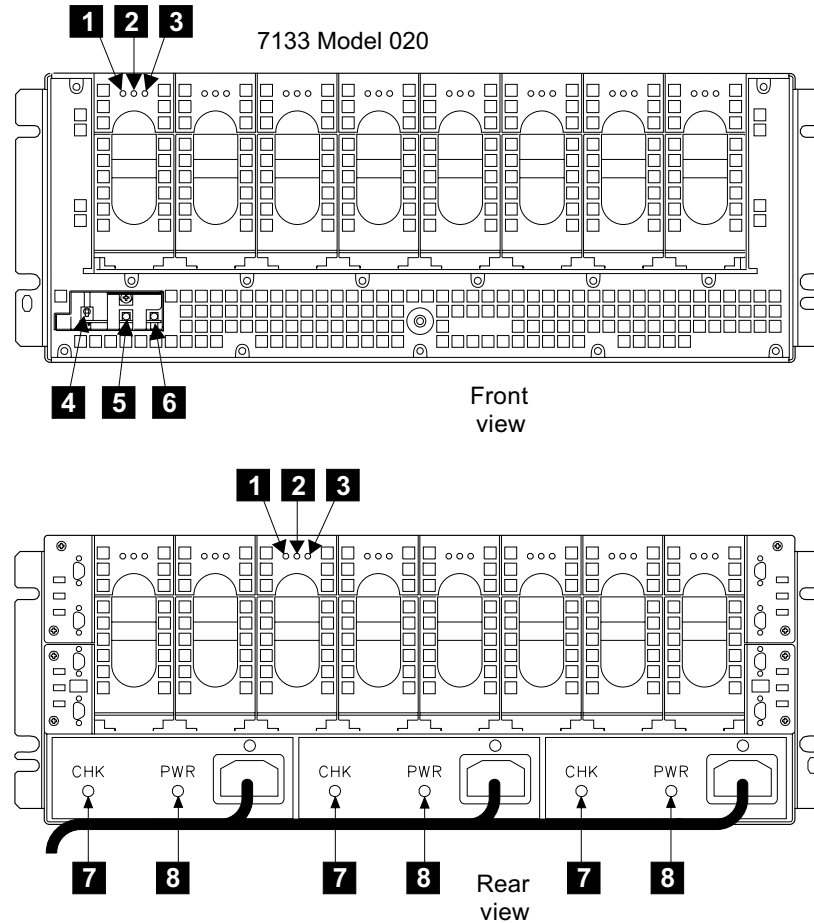
Figure 145. 7133 Model 020 Drawer and DDM Indicators (t008861p)

__ 5. The SSA device card automatically configures the SSA loop when power is supplied to the disk drive modules. This configuration might take a few minutes to complete. When the indicators of all the disk drive modules are on continuously (not blinking), configuration is complete.

When the configuration is complete, observe the 7133, and check whether all the indicators are as described here: Refer to the diagram on page 159.

Note: The fan-and-power-supply PWR (power) indicators ⑧ may be hidden by the fan mounting latches.

SSA DASD drawer Subsystem Power indicator ⑤ :	On
SSA DASD drawer Subsystem Check indicator ⑥ :	Off
All three fan-and-power PWR (power) indicators ⑧ :	On
All three fan-and-power CHK (check) indicators ⑦ :	Off
All disk drive module Power indicators ① :	On
All disk drive module Ready indicators ② :	On
All disk drive module Check indicators ③ :	Off

If any Power indicator or Ready indicator fails to come on, or any Check indicator fails to go out, go to MAP 3151 in chapter 3 of the 2105 Model Exx/Fxx Service Guide.

Installing a 7133 Device Drawer

When all the Power indicators and Ready indicators are on, and all the Check indicators are off, continue with step 6.

__ 6. On Model 020 drawers only, verify that redundant power is present at the center fan-and-power-supply assembly:

   a. Perform this test only on the drawer power cables to the drawer you are installing.

   b. Disconnect the center drawer power cable from the front bulk power supply. For the location of the drawer-# center cable being disconnected, see "2105 Model 100 Front Bulk Power Supply Cable Physical Location Codes" on page 180.

   c. Verify that the PWR (power) indicator, **8** in Figure 145 on page 159, on the center fan-and-power-supply assembly is on.

   d. Reconnect the drawer power cable to the front bulk power supply.

   e. Disconnect the center drawer power cable from the rear bulk power supply. For the location of the drawer-# center cable being disconnected, see "2105 Model 100 Rear Bulk Power Supply Cable Physical Location Codes" on page 181.

   f. Verify that the PWR (power) indicator, **8** in Figure 145 on page 159, on the center fan-and-power-supply assembly is on.

   g. Reconnect the drawer power cable to the rear bulk power supply.

   • If the PWR (power) indicator remained on for both tests, go to step 9 on page 161 .

   • If the PWR (power) indicator did not remained on for both tests, there is a problem with the center drawer power cable or the associated front or rear bulk power assembly, go to MAP 3150 in chapter 3 of the 2105 Model Exx/Fxx Service Guide.

   Continue with step 9 on page 161.

__ 7. Switch on both power supply assemblies on the 7133 Model 040 drawer. Pull each PWR/FAULT RESET switch **9** then **10** out and push it up.
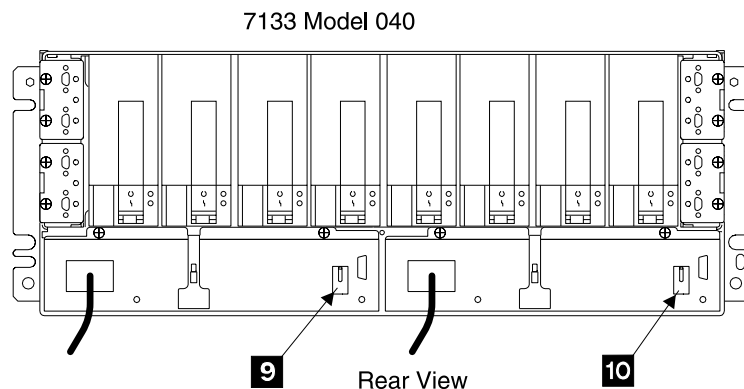
Figure 146. M4. Power Supply Assembly Locations (t007600l)

__ 8. The SSA device card automatically configures the SSA loop when power is supplied to the disk drive modules. This configuration might take a few minutes to complete. When the indicators of all the disk drive modules are on continuously (not blinking), configuration is complete.

When the configuration is complete, observe the 7133, and check whether all the indicators are as described here: Refer to the diagram on page 160,

All disk drive module Ready indicators **11** :	On
All disk drive module Check indicators **12** :	Off
SSA DASD drawer controller card check indicator **13** :	Off
All three fan assembly PWR (power) indicators **14** :	On
All three fan assembly CHK (check) indicators **15** :	Off
Both power supply assembly PWR (power) indicators **16** :	On
Both power supply assembly CHK/PWR Good indicators **17** :	On, Green

If any Power indicator or Ready indicator fails to come on, or any Check indicator fails to go out, go to MAP 3151 in chapter 3 of the 2105 Model Exx/Fxx Service Guide.

When all the Power indicators and Ready indicators are on, and all the Check indicators are off, continue with step 9.

7133 Model 040

Front View

Rear View
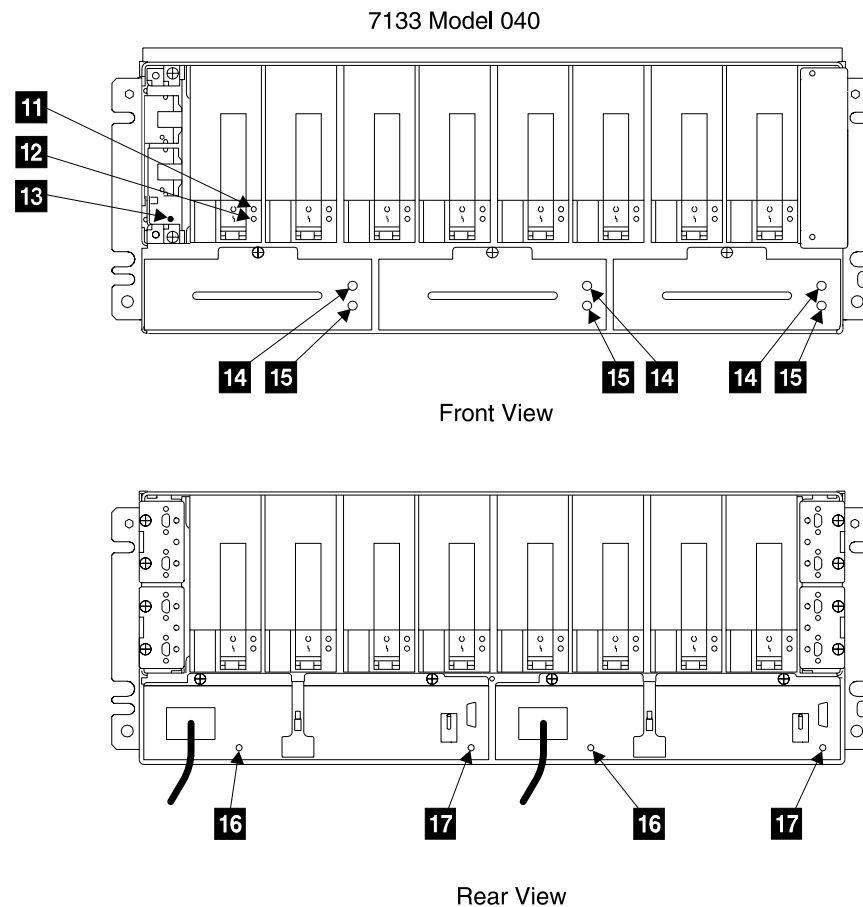
Figure 147. Model 040 Drawer and DDM Indicators (t007590p)

__ 9. Return to the service terminal to run system diagnostics on the drawer being installed.

> **Note:** If the diagnostics indicate a possible SSA cabling error, verify that the SSA cables and jumpers are connected correctly.

Completing the Installation of a 7133 Device Drawer

__ 1. Are the SSA DASD drawers being installed as part of FC 1121 or FC 1122 rack installation?

- **Yes**, go to "Completing the Installation of the 2105 Model 100 Racks" on page 128 to complete this installation and perform the optional batch configuration of the 2105 subsystem.

- **No**, perform the configuration of the new SSA DASD drawer or drawers:

  a. **Perform the logical configuration of the 2105 Model 100**, using the Configuration Worksheets found in the *IBM Enterprise Storage Server Configuration Planner* book, form number GC26-7353.

     Notes:

     1) If the customer chooses to perform their own logical configuration using the ESS Specialist, this procedure is not necessary.

     2) When storage is being added to a previously configured SSA loop, the ESS Specialist must be used. The ESS Batch Configuration Tool (below) can only be used on previously un-configured SSA loops.

  b. From the service terminal **Main Service Menu**, select:

     Configuration Options Menu

      ESS Batch Configuration Tool Menu

       Define a Storage Configuration

        Note: Check if the SSA card that you want to configure is in the **A List of All Unconfigured SSA Cards**. If the SSA card is not listed, the drawers belonging to that SSA card must be configured using the ESS Specialist.

       Enter the information from the Configuration Worksheets found in the *IBM Enterprise Storage Server Configuration Planner* book, form number GC26-7353.

        Apply Defined Storage Configuration List

        Note: The application of the Defined Storage Configuration is a background process that may take several hours to complete. This installation procedure will later use the **Display Status of Apply Process** to verify completion status before giving the 2105 to the customer.

      Perform ESS Specialist Configuration from ESSNet Console

      If additional configuration needs to be completed, use the ESS Specialist from the ESSNet console.

      Return here when the configuration is completed and continue with the next step.

  c. Make a copy of all of the customer worksheets and put the copy in the 2105 Model Exx/Fxx document enclosure. This information may be needed for future repair or configuration activities.

__ 2. The installation of the SSA DASD drawer is complete, return the machine to the customer.

Relocating a 2105 Model 100

Attention: This FRU is ESD-sensitive. Always wear an ESD wrist strap when servicing this FRU. Follow the ESD procedures in "Working with ESD-Sensitive Parts" on page 34.

Note: These instructions are only to be used to relocate (move) an entire 2105 ESS subsystem with attached 2105 Model 100s. Do not perform this procedure until you are directed to by "Relocating a 2105 Model Exx/Fxx Subsystem" in chapter 5 of the *Enterprise Storage Server Service Guide, Volume 2*.

These instructions describe how to:

- Power off the 2105.
- Identify and label disconnected cable connectors.
- Disconnect the 2105 power cables.
- Disconnect the 2105 Model 100 interface, control, and communication cables.
- Disconnect 2105 Model 100 racks from a 2105 Model Exx/Fxx Subsystem.
- Reinstall the 2105 subsystem at the new location.

Notes:

1. These instructions describe moving 2105 Model 100 racks within an account (relocating). The term *moving* will be used in this procedure to identify relocation activities.
2. These instructions only support moving all 2105 Model Exx/Fxx and 2105 Model 100 racks in a subsystem at the same time.
3. This procedure supports moving multiple 2105 racks only when they are part of the same subsystem.
4. Because these instructions describe moving 2105 Model 100 racks, some diagrams might not specifically show the model that you are moving.

Determine if Shipping Containers are Required?

Place a check mark next to each completed step.

__ 1. Determine if you are relocating the 2105 to another location on the same floor, or relocating it to another floor/building:

   - **Relocating to same floor**, go to step "Determine Configuration and Racks Being Moved".
   - **Relocating to another floor/building**, go to step 2.

__ 2. Verify that the correct relocation kit is available for the 2105 Model 100 you are relocating:

   - 2105 Model 100, use relocation kit part number 7357091

   Continue with "Determine Configuration and Racks Being Moved".

Determine Configuration and Racks Being Moved

Place a check mark next to each completed step.

__ 1. Determine what the configuration of the subsystem you are working with is.

__ 2. Determine the Type-Model and Serial Number of each 2105 you will be moving.

__ 3. Continue with "Removing Power From the 2105 Model 100" on page 164.

Removing Power From the 2105 Model 100

Place a check mark next to each completed step.

__ 1. Set the 350 V battery circuit breaker (CB) **1** to Off (O, down) on all front and rear 350 V batteries in the subsystem.
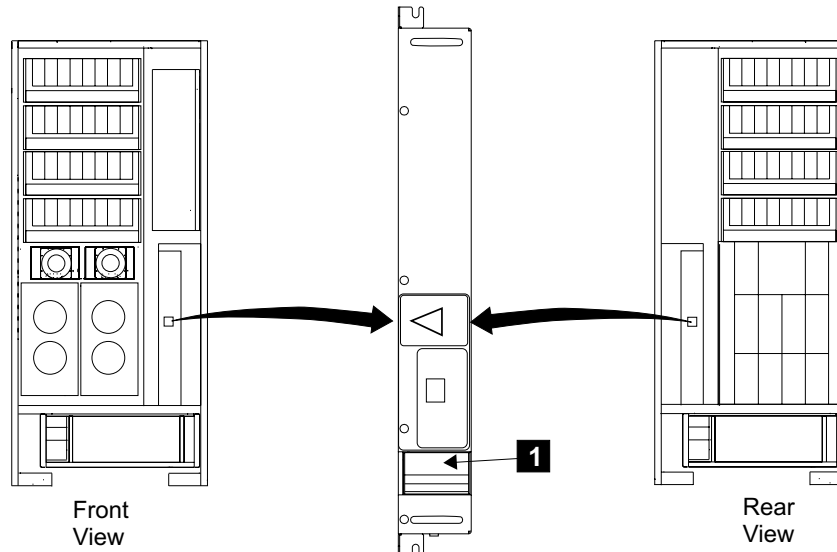
Figure 148. 350 Volt Battery Locations (t009039)

__ 2. Open the front or rear cover of each 2105 Model 100 rack in the subsystem and locate the bulk power supplies:

- 2105 Model 100 bulk power supply, front **2**
- 2105 Model 100 bulk power supply, rear **3**

2105 Model 100
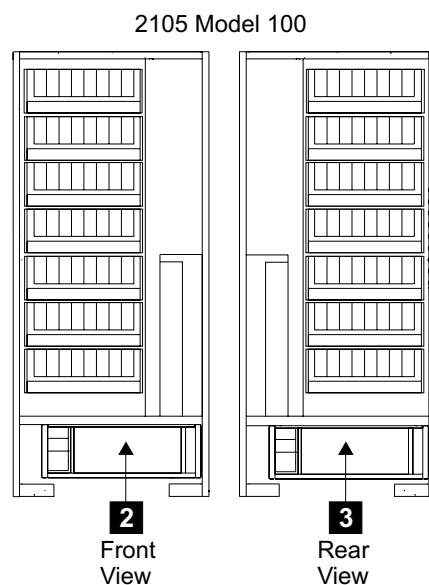
Figure 149. Bulk Power Supply Locations (t009040)

__ 3. Switch the System Power circuit breaker (CB) **4** to Off (O, down) on all of the front and rear bulk power supplies in the subsystem.
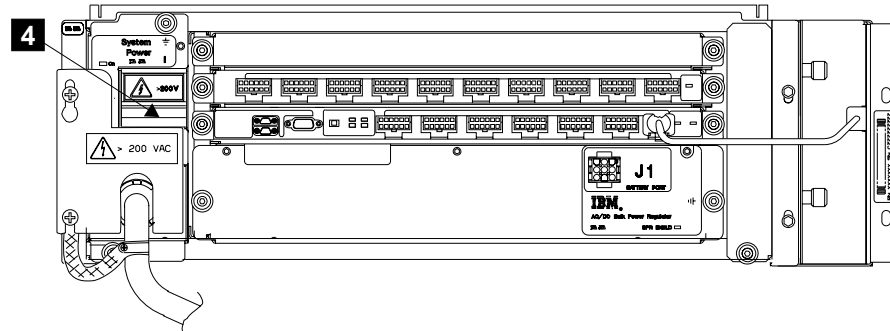
Figure 150. Bulk Power Supply System Power CB Location (t009041)

__ 4. Instruct the customer to switch off the circuit breaker that supplies mainline ac voltage to both mainline power cables for each 2105 rack you are moving in the subsystem.

Attach a "Do Not Operate" tag (S229-0237) and the safety lockout padlock to each of these tripped customer ac mainline voltage circuit breakers. Refer to *Electrical Safety for IBM Customer Engineers* book.

> **Note:** Each 2105 Model 100 rack in the subsystem has two mainline power cables that connect to the front and the rear bulk power supply in each rack.

__ 5. Determine where the two mainline power cables from each 2105 you are moving connect to the customers power. Note if the customer end of the mainline power cable is connected to customer power by a pluggable connector or wires and terminals.

Disconnect these mainline power cables from the customers AC power:

- For ***plug*** in mainline power cables, you can disconnect the connector.

- For ***wired*** in mainline power cables, instruct the customer to call a license electrician to disconnect the wired mainline power cables from the customers mainline power sources.

Continue with "Disconnect Mainline Power Cables from Rack Being Moved".

Disconnect Mainline Power Cables from Rack Being Moved

Attention: Do the following mainline power cable procedures only on the 2105 being moved.

Place a check mark next to each completed step.

__ 1. On all 2105 Model 100 racks being moved, remove all of the front rear tailgate cable clamps and EMC plates that are retaining cables:

> **Note:** Save parts for later installation.

- For 2105 Model 100 moves, see "2105 Model 100 Tailgate Cable Clamp Removal and Installation" on page 131.

__ 2. Loosen the power cable retention plate top screw **1** and remove the bottom screw **2**.

__ 3. Remove the mainline power cable retention plate **5**.

Relocating a 2105 ESS Attachment Subsystem

___ 4. Disconnect the mainline power cables from the bulk power supply J1 connectors **4** .

___ 5. Install all retention plates **5** and tighten screws **1** and **2** .
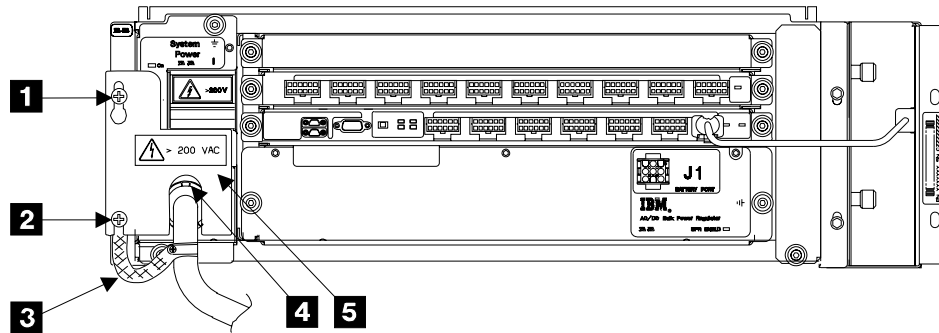
Figure 151. Bulk Power Supply Locations (t007536l)

___ 6. Remove the mainline power cables from each 2105.

Do the following tailgate removal procedure only if there is not enough clearance to route the mainline power cable connector through the tailgate:

a. Remove the four tailgate mounting screws **3** and **4** .

b. Remove the tailgate assembly **9** from the 2105.

c. Feed the mainline power cable connector **8** through the free tailgate **9** .

d. Route the mainline power cable to the rear of the 2105 or under the floor.

e. Install the tailgate assembly **9** into the 2105 then install the four mounting screws **6** and **7** .
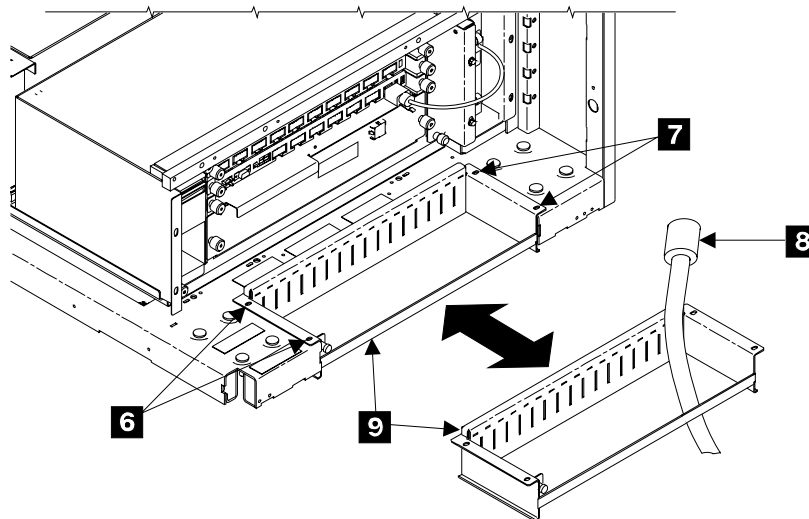
Figure 152. 2105 Tailgate Removal (t007537m)

___ 7. Continue with "Disconnect Control and Interface Cables".

Disconnect Control and Interface Cables

Place a check mark next to each completed step.

Relocating a 2105 ESS Attachment Subsystem

__ 1. Disconnect the bulk power supply interconnect cables from the RPC cards at the rear of the 2105 Model Exx/Fxx. Disconnect the interconnect cables from RPC-1 J3 connector and RPC-2 J3 connector.

- With only one 2105 Model 100, the above cables are connected to the 2105 Model Exx/Fxx.
- With a second 2105 Model 100, there is a power interconnect cable between the front and rear bulk power supplies of racks 2 and 3. Disconnect the interconnect cables from the R2 rack J9t connectors on both the front and rear bulk power supplies.

__ 2. Ensure that all disconnected cable connectors are properly labeled for reinstallation.

__ 3. Pull the free bulk power supply interconnect cables from the 2105 Model Exx/Fxx into the 2105 Model 100 rack R2. Pull any existing power interconnect cables from the R3 rack out of the R2 rack.

> **Note:** The cables should still be connected to 2105 Model 100 front and rear bulk power supplies at connector J9t **2** .

1 J9t, 2105 Model 100 (R2)

2 J9b-A, 2105 Model 100 (R3)
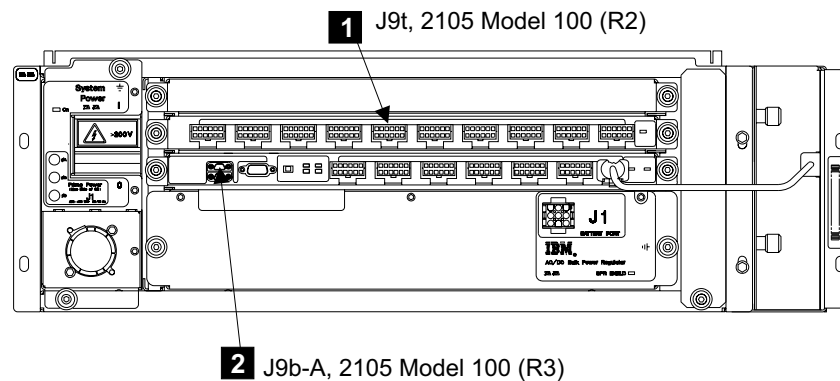
Figure 153. Bulk Power Supply Connector locations (t009042)

__ 4. Locate all SSA device cables from the 2105 Model 100 to the 2105 Model Exx/Fxx SSA device cards. Disconnect all of these SSA device cables from the SSA device cards.

> **Note:** Ensure that all SSA device cable connectors are labeled for reinstallation before disconnecting them.

Relocating a 2105 ESS Attachment Subsystem
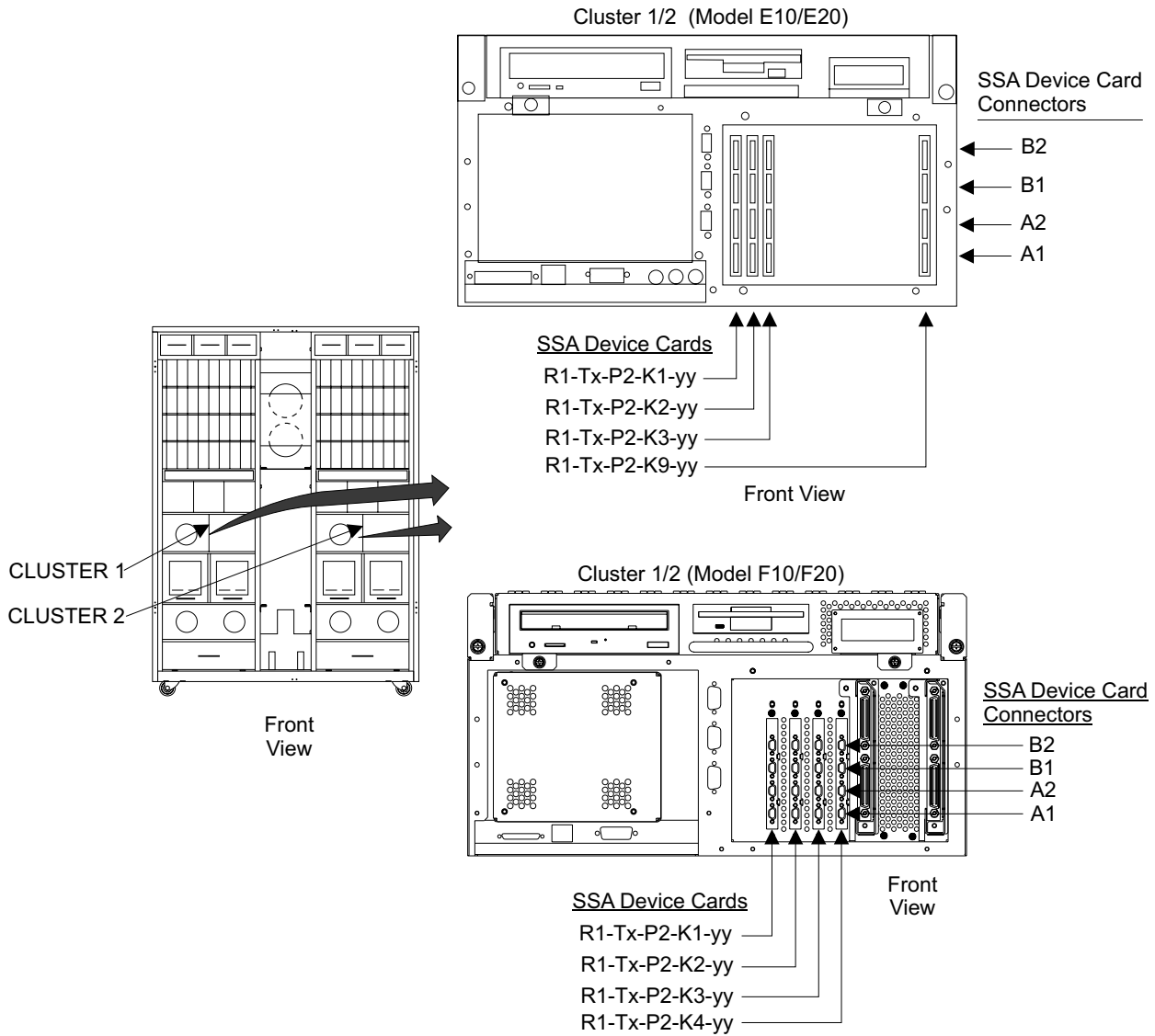
Figure 154. 4-Slot Bay SSA Device Cable Connections (s008801q)

__ 5. Free the SSA device cables from the 2105 Model Exx/Fxx and pull them into the 2105 Model 100 frame or frames. Roll these cables up in the open area above the 2105 Model 100 rear 350 V battery.
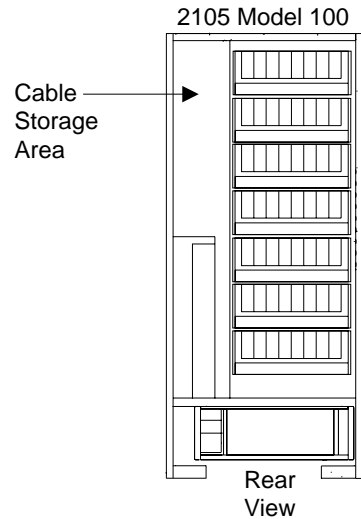
2105 Model 100

Figure 155. SSA Device Cable Storage for Removal (t007545m)

Disconnecting 2105 Model 100 Frames

Place a check mark next to each completed step.

__ 1. **Attention:** Use this step only when you have two 2105 Model 100 frames that are bolted together.

Remove the two front bolts and washers **1** and two rear bolts and washers, not shown, that fasten the two 2105 Model 100s together.

> **Note:** Keep the four bolts and washers with one of the 2105 Model 100 racks.

Front View
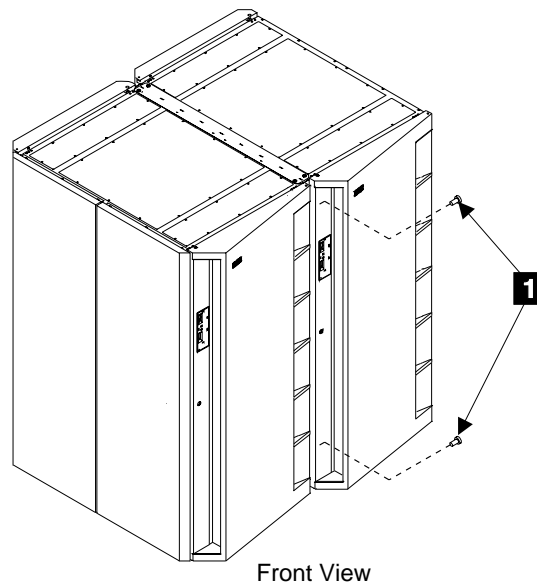
Figure 156. 2105 Model 100 Frame Bolts (t007542m)

__ 2. Remove the wedge locks **2** from the casters of all 2105s you will be moving.

Relocating a 2105 ESS Attachment Subsystem
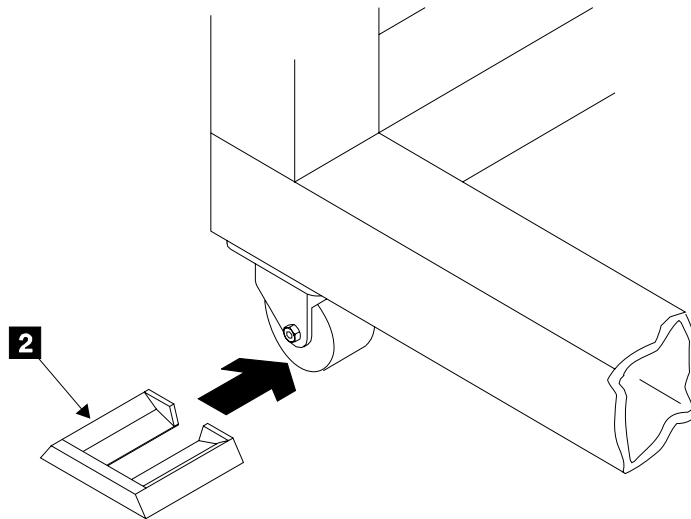
Figure 157. Caster Wedge Locks (t007543m)

__ 3. On all 2105 Model 100 racks being moved, reinstall all the front and rear tailgate cable clamps and ESD plates:

   • **For 2105 Model 100 moves**, see "Tailgate Cable Clamp Installation 2105 Model 100" on page 134.

__ 4. Continue with "Moving the 2105 ESS Subsystem".

Moving the 2105 ESS Subsystem

Place a check mark next to each completed step.

__ 1. Select your move activity below:

   • **Relocating 2105 subsystem on the same floor**: Continue with ″Moving the 2105 Model Exx/Fxx Subsystem″ in chapter 5 of the *Enterprise Storage Server Service Guide, Volume 2*.

   • **Relocating 2105 subsystem to another floor/building**:

     Pack the 2105 Model 100 for removal. Follow the instructions that came with the packing materials to pack the 2105 Model 100 for shipping.

Shipping From	Part Number
U.S. or Canada	08L8091
Asia Pacific	08L8091
Latin America	08L8091
EMEA	08L8091

__ 2. Continue with ″Moving the 2105 Model Exx/Fxx Subsystem″ in chapter 5 of the *Enterprise Storage Server Service Guide, Volume 2*.

Chapter 6. Logical Configuration of Storage Facility

Logical configuration is handled in the service guide for the 2105 Model Exx/Fxx that the 2105 Model 100 racks attach to. No configuration is done by the ESS subsystem.

Chapter 7. 2105 Model 100 Locations

2105 Model 100 Locations

FRU locations for 2105 Model 100 are shown below, and in Figure 158 on page 174. For 2105 FRU location code information see "Location Codes" on page 175.

2105 Model 100 Front Locations

0	SSA DASD drawer 0, standard physical location
1	SSA DASD drawer 1, standard physical location
2	SSA DASD drawer 2, standard physical location
3	SSA DASD drawer 3, standard physical location
4	SSA DASD drawer 4, standard physical location
5	SSA DASD drawer 5, standard physical location
6	Drawer 6, not used when attached to an ESS subsystem
7	Bulk power supply
8	Mainline power cable
9	Disk Drive Modules 1 to 8 (shown in top drawer only) 9
10	350 V Battery 0
11	Bulk power supply fan
12	Tailgate

2105 Model 100 Rear Locations

13	Disk Drive Modules 9 to 16 (shown in top drawer only)

Locations

`14`	350 V Battery
`15`	Bulk power supply
`16`	Mainline power cable
`17`	Drawer 6, not used when attached to an ESS subsystem
`18`	SSA DASD drawer 5, standard physical location
`19`	SSA DASD drawer 4, standard physical location
`20`	SSA DASD drawer 3, standard physical location
`21`	SSA DASD drawer 2, standard physical location
`22`	SSA DASD drawer 1, standard physical location
`23`	SSA DASD drawer 0, standard physical location
`24`	Bulk power supply fan
`25`	Tailgate
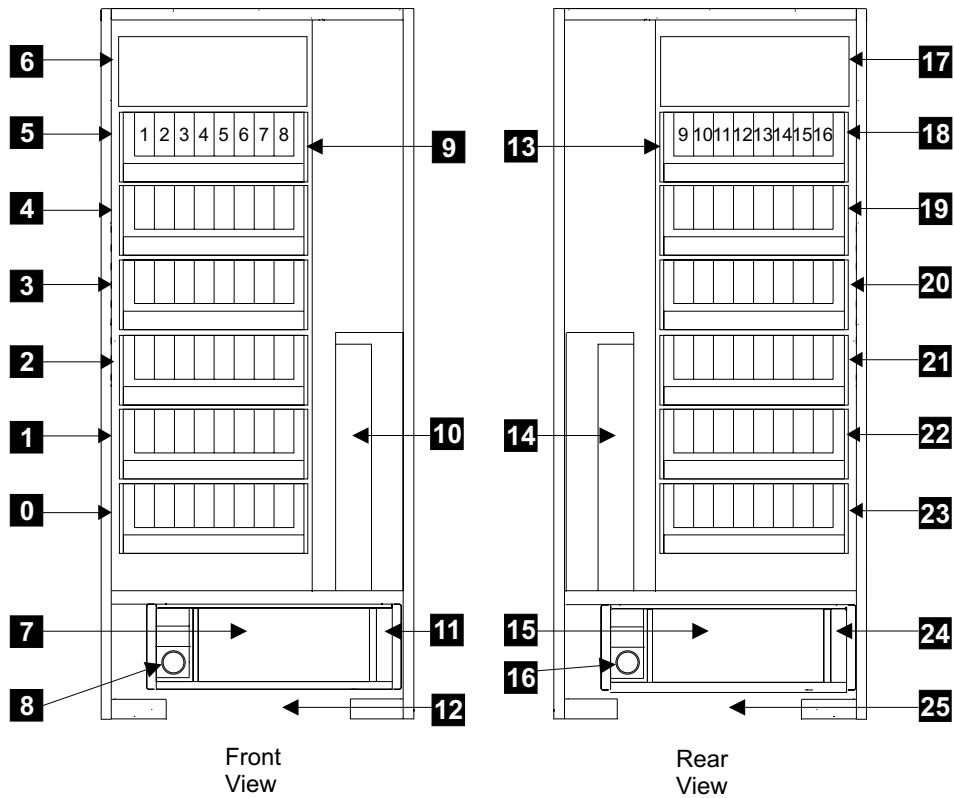
Figure 158. 2105 Model 100 Front and Rear Locations Diagram (t007474p)

Bulk Power Supply (BPS) Component Locations

The figure below shows the components that make up the bulk power supply (BPS). The BPA, BPC, BPD, BPR, and BPF are all mounted in the BPS. They are identified to support procedures in this book. The BPS, BPC, BPD, BPR, and BPF (fan) are all field replaceable units. When the BPA fails, the entire BPS is replaced.
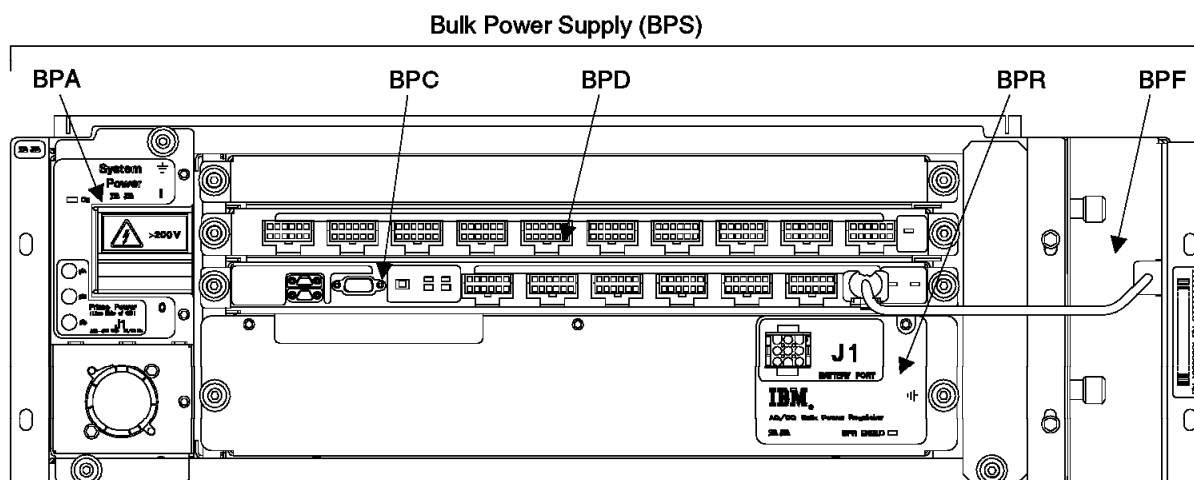
Figure 159. Bulk Power Supply Component Locations (t007488m)

Location Codes

The 2105 Model 100 storage facility uses Physical Location Codes or AIX Location Codes to provide mapping of the failing field replaceable units. The location codes are produced by the system unit's firmware and AIX.

For quick access to the FRU location diagrams, find the FRU area below and go to the indicated page:

- "SSA DASD Drawer Physical Location Codes" on page 183
- "SSA DASD Drawer Disk Drive Module Physical Location Codes" on page 184
- "SSA DASD Drawer Components Physical Location Codes, Model 020 Drawer" on page 185
- "SSA DASD Drawer Components Physical Location Codes, Model 040 Drawer" on page 186
- "2105 Model 100 Rack Front Physical Location Codes" on page 180
- "350 V Battery Physical Location Codes" on page 182

AIX Location Codes

The basic formats of the AIX location codes are:
- For non-SCSI devices/drives
  AB-CD-EF-GH
- For SCSI devices/drives
  AB-CD-EF-G,H

For planars, cards, and non-SCSI devices the location code is defined as:

```
AB-CD-EF-GH
 │  │  │  │
 │  │  │  Device/FRU/Port ID
 │  │  Connector ID
 │  devfunc Number, Adapter Number or Physical Location
 Bus Type or PCI Parent Bus
```

- The AB value identifies a bus type or PCI parent bus as assigned by the firmware.

Locations

- The CD value identifies adapter number, adapter's devfunc number, or physical location. The devfunc number is defined as the PCI device number times 8, plus the function number.
- The EF value identifies a connector.
- The GH value identifies a port, address, device, or FRU.

Adapters and cards are identified with just AB-CD.

The possible values for AB are:

00   Processor bus

01   ISA bus

02   EISA bus

03   MCA bus

04   PCI bus used in the case where the PCI bus cannot be identified

05   PCMCIA busses

xy   For PCI adapters where X is equal to or greater than 1. The x and y are characters in the range of 0-9, A-H, J-N, P-Z (O, I, and lower case are omitted) and are equal to the parent bus's IBM, aix-loc Open Firmware Property.

The possible values for CD depend on the adapter/card.

For pluggable PCI adapters/cards, CD is the device's devfunc number (PCI device number times 8, plus the function number). The C and D are characters in the range of 0-9, and A-F (hex numbers). This allows the location code to uniquely identify multiple adapters on individual PCI cards.

For pluggable ISA adapters, CD is equal to the order the ISA cards defined/configured either by SMIT or the ISA Adapter Configuration Service Aid.

For integrated ISA adapters, CD is equal to a unique code identifying the ISA adapter. In most cases this is equal to the adapter's physical location code. In cases where a physical location code is not available, CD will be FF.

EF is the connector ID. It is used to identify the adapter's connector that a resource is attached to.

GH is used to identify a port, device, or FRU. For example:
- For async devices GH defines the port on the fanout box. The values are 00 to 15.
- For a diskette drive H defines which diskette drive 1 or 2. G is always 0.
- For all other devices GH is equal to 00.

For integrated adapter, EF-GH is the same as the definition for a pluggable adapter. For example, the location code for a diskette drive is 01-D1-00-00. A second diskette drive is 01-D1-00-01.

For SCSI the location code is defined as:

```
AB-CD-EF-G,H
 | |  | | |
 | |  | | Logical Unit address of the SCSI Device
```

```
│  │  │ Control Unit Address of the SCSI Device
│  │  Connector ID
│  devfunc Number, Adapter Number or Physical Location
Bus Type or PCI Parent Bus
```

Where AB-CD-EF are the same as non-SCSI devices.

G defines the control unit address of the device. Values of 0 to 15 are valid.

H defines the logical unit address of the device. Values of 0 to 255 are valid.

There is also a bus location code that is generated as '00-XXXXXXXX' where XXXXXXXX is equivalent to the node's unit address.

Examples of physical location codes displayed by AIX are:
- Processor Card in slot 1 of planar 1

    P1-C1
- Memory DIMM in system planar slot 2

    P1-M2
- Memory DIMM 12 in card in slot 2 of system planar

    U1-P1-M2.12

Examples of AIX location codes displayed are:
- Integrated PCI adapter

    10-80   Ethernet

    10-60   Integrated SCSI Port 1

    30-58   Integrated SCSI Port 2
- Pluggable PCI adapters

    20-58 to 20-5F

                 Any PCI card in slot 1

    20-60 to 20-67

                 Any PCI card in slot 2

    10-68 to 10-6F

                 Any PCI card in slot 3

    10-70 to 10-77

                 Any PCI card in slot 4

    10-78 to 10-7F

                 Any PCI card in slot 5

    30-60 to 30-67

                 Any PCI card in slot 6

    30-68 to 30-6F

                 Any PCI card in slot 7

    30-70 to 30-77

                 Any PCI card in slot 8

    30-78 to 30-7F

                 Any PCI card in slot 9
- Integrated ISA adapters

    01-D1   Diskette adapter

Locations

01-R1	Parallel port adapter
01-S1	Serial port 1 adapter
01-S2	Serial port 2 adapter
01-S3	Serial port 3 adapter
01-K1	Keyboard adapter

- Non-integrated ISA adapters

01-01	First ISA card defined/configured
01-02	Second ISA card defined/configured

- Device attached to SCSI controller

10-60-00-4,0	Device attached to Integrated SCSI Port 1

Physical Location Codes

Physical location codes provide a mapping of logical functions in a platform (or expansion sites for logical functions, such as connectors or ports) to their specific locations within the physical structure of the platform.

Location Code Format

The format for the location code is an alphanumeric string of variable length, consisting of a series of location identifiers, separated by the standard dash (-) or slash (/) character. The series is hierarchical; that is, each location identifier in the string is a physical child of the one preceding it.

- The - (dash) separator character represents a normal structural relationship where the child is a separate physical package and it plugs into (or is connected to) the parent. For example, P1-C1 is a CPU card (C1) plugged into a planar (P1), or P1-M1 is a memory card (M1) plugged into a planar (P1).

- The / (slash) separator character separates the base location code of a function from any extended location information. A group of logical devices can have the same base location code because they are all on the same physical package, but may require extended location information to describe the connectors they support. For example, P2/S1 describes the location of the serial port 1 controller and its connector (S1), which is located on planar P2 (its base location code), but the / indicates that further devices can be connected to it at the external S1 serial connector. The keyboard controller and its connector likewise have location code P2/K1, which means they have the same base location code (P2) as serial port 1, but a different external connector. In contrast, the location code P2-K1 actually points to the device connected to connector K1; that is, the keyboard. The location code P2/Z1 indicates an integrated SCSI controller which drives connector Z1, while location codes of P2-Z1-... point to the actual SCSI bus and devices.

Each location identifier consists of one alpha prefix character that identifies a location type, and a decimal integer number (typically one or two digits) that identifies a specific instance of this location type. Certain location types may also support secondary sub-locations, which are indicated by appending a period (″.″) character and a sub-location instance number.

Specifically, the format of a location code is defined as follows:

pn[.n][- or /]pn[.n][- or /]...

Where p is a defined alpha location type prefix, n is a location instance number, and [.n] is a sub-location instance number (where applicable). Sub-location notation is used only for location types which have clearly defined and limited expansion sites; for example, memory SIMMs slots on a memory card. Primarily, the [.n] sub-location notation is intended for use as an abbreviation of the location code in cases where:

1. Based on the device structure, the abbreviated sub-location code conveys the same information in a more concise form than an additional level of location identifier -- for example:
   - P1-M1.4 (pluggable DIMM 4 on Memory Card 1 on Planar 1), rather than P1-M1-M4
   - P1-C1.1 (pluggable CPU 1 on CPU Card 1 on Planar 1), rather than P1-C1-C1
   - P2-Z1-A3.1 (LUN 1 at SCSI ID 3 on integrated SCSI bus 1 from Planar 2), rather than P2-Z1-A3-A1

2. The sub-location is either a basic physical extension or sub-enclosure of the base location, but does not represent additional function or connectivity; for example, a drawer in a rack (U1.2) or a riser card on an I/O planar (P2.1).

2105 Model 100 Location Code Legend

A	= Address (SCSI ID)
B	= Bay (Bww)...where ″ww″ = Bays 1...10
C	= Card or CPU Processor (C1) or Cache Module on a card (C1.1)
D	= Diskette Drive (D1) or Disk Drive Module (Ddd)...where ″dd″ = DDM 1...16, or 7133 drawer (DRAWERdd)...where ″dd″ = Logical Drawer positions 0...17
E	= Ethernet
F	= Fan or sensor (Ff)...where ″f″ = Fan 1...3
G	= Rack Power Control Card (G1 or G2)
H	= Ultra SCSI Host Card (Hh)...where ″h″ = Ultra SCSI Host Card slot 1 or 4
I	= I/O Attachment Card slot (I1...9)
J	= Connector (J1) or Bulk Power Distribution Connectors...where ″J10t″
	= Connector J10 on ″t″ (top row) or ″b″ (bottom row)...or ″J10t.1″
	= a cable from connector J10t
K	= SSA Device Card (Kk)...where ″k″ = SSA Device Card slot 2 or 3
L	= LCD Operator Panel (L1)
M	= Memory Card (M1/2) or Memory Module (M1.mm)...where ″mm″ = 1...16)
N	= Un-identified Connector (Nnn)...where ″nn″ = 1-99
O	= unused
P	= Planar or Backplane (P1)
Q	= unused
R	= Rack (Rr)...where ″r″ = Rack 1...3

Locations

S	= Serial Port (Ss)...where ″s″ = Serial Port 1...3
T	= Cluster (Ty)...where ″y″ = Cluster Bay 0/1
U	= unused
V	= Voltage (Power Supply/Backup Battery) (V1)
W	= unused
X	= Extra-Function Card (i.e. Service processor) (X1)
Y	= Device drawer (Y0...Y5, Y6 not used)
Z	= SCSI (i.e. scuZzy) connector

2105 Model 100 Rack Front Physical Location Codes

1 Rack operator panel (R1-L2)
2 Bulk power supply - 2105 Model 100 (Rr-V3)
3 Bulk power supply - 2105 Model 100 (Rr-V4)

Note: ″Rr″ is either rack 2 or 3.
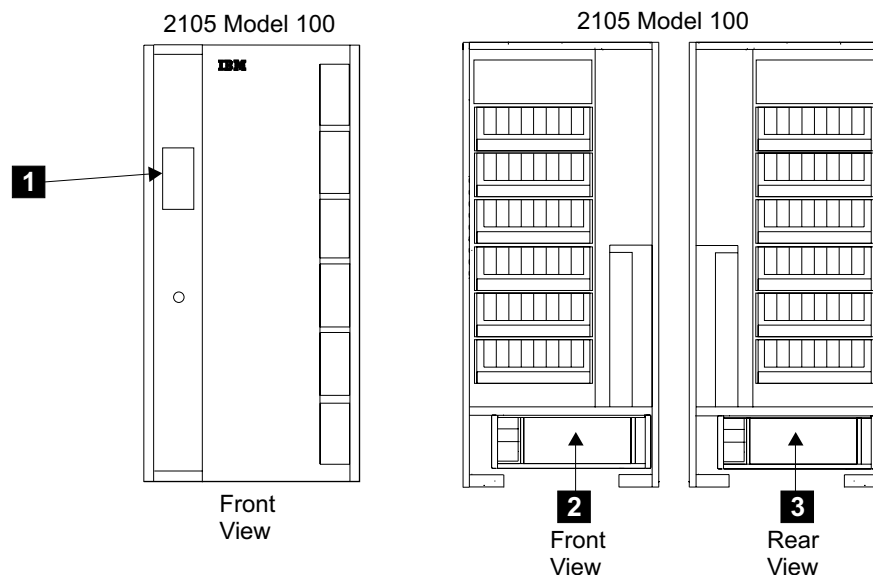
Figure 160. 2105 Model 100 Rack Front Physical Location Codes (t009032)

Bulk Power Supply Connection Physical Location Codes

The physical location codes for the front and the rear bulk power supplies cables are different. The cable location codes for 2105 Model 100 front and rear bulk power supplies are found on the following pages:

- "2105 Model 100 Front Bulk Power Supply Cable Physical Location Codes"
- "2105 Model 100 Rear Bulk Power Supply Cable Physical Location Codes" on page 181

2105 Model 100 Front Bulk Power Supply Cable Physical Location Codes

1 R2 to R3 power output interconnect cable (Rr-V3-J7t.1)
2 Drawer power cable (drawer-5 center) (Rr-V3-J6t.1)
3 Drawer power cable (drawer-4 center) (Rr-V3-J5t.1)
4 Drawer power cable (drawer-3 center) (Rr-V3-J4t.1)

5 Drawer power cable (drawer-2 center) (Rr-V3-J3t.1)
6 Drawer power cable (drawer-1 center) (Rr-V3-J2t.1)
7 Drawer power cable (drawer-0 center) (Rr-V3-J1t.1)
8 Bulk power supply fan (Rr-V3-F1)
9 Mainline power cable (Rr-V3-N1.1)
10 Bulk power supply interconnect cable (Rr-V3-J9b-B.1)
11 R2 to R3 power input cable (Rr-V3-J9b-A.1)
12 ESS to R2 power input and UEPO P1 cable (Rr-V3-J8b.1)
13 Drawer power cable (drawer-5 left) (Rr-V3-J7b.1)
14 Drawer power cable (drawer-4 left) (Rr-V3-J6b.1)
15 Drawer power cable (drawer-3 left) (Rr-V3-J5b.1)
16 Drawer power cable (drawer-2 left) (Rr-V3-J4b.1)
17 Drawer power cable (drawer-1 left) (Rr-V3-J3b.1)
18 Bulk P.S. to 350 V battery cable) (Rr-V3-N2.1)
19 Drawer power cable (drawer-0 left) (Rr-V3-J2b.1)

2105 Model 100
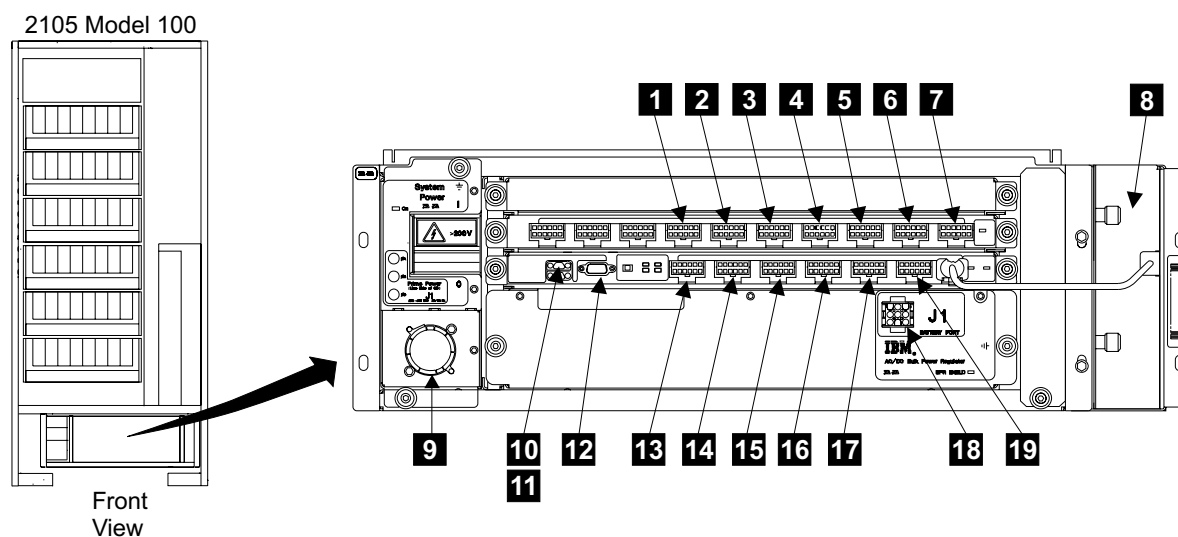
Front
View

Figure 161. 2105 Model 100 Front Bulk Power Supply Physical Location Codes (t009033)

2105 Model 100 Rear Bulk Power Supply Cable Physical Location Codes

1 R2 to R3 power output interconnect cable (Rr-V4-J7t.1)
2 Drawer power cable (drawer-5 center) (Rr-V4-J6t.1)
3 Drawer power cable (drawer-4 center) (Rr-V4-J5t.1)
4 Drawer power cable (drawer-3 center) (Rr-V4-J4t.1)
5 Drawer power cable (drawer-2 center) (Rr-V4-J3t.1)
6 Drawer power cable (drawer-1 center) (Rr-V4-J2t.1)
7 Drawer power cable (drawer-0 center) (Rr-V4-J1t.1)
8 Bulk power supply fan (Rr-V4-F1)
9 Mainline power cable (Rr-V4-N1.1)
10 Bulk power supply interconnect cable (Rr-V4-J9b-B.1)
11 R2 to R3 power input cable (Rr-V3-J9b-A.1)
12 ESS to R2 power input and UEPO P2 cable (Rr-V4-J8b.1)
13 Drawer power cable (drawer-5 right) (Rr-V4-J7b.1)
14 Drawer power cable (drawer-4 right) (Rr-V4-J6b.1)
15 Drawer power cable (drawer-3 right) (Rr-V4-J5b.1)
16 Drawer power cable (drawer-2 right) (Rr-V4-J4b.1)
17 Drawer power cable (drawer-1 right) (Rr-V4-J3b.1)
18 Bulk P.S. to 350 V battery cable) (Rr-V4-N2.1)

19 Drawer power cable (drawer-0 right) (Rr-V4-J2b.1)

2105 Model 100
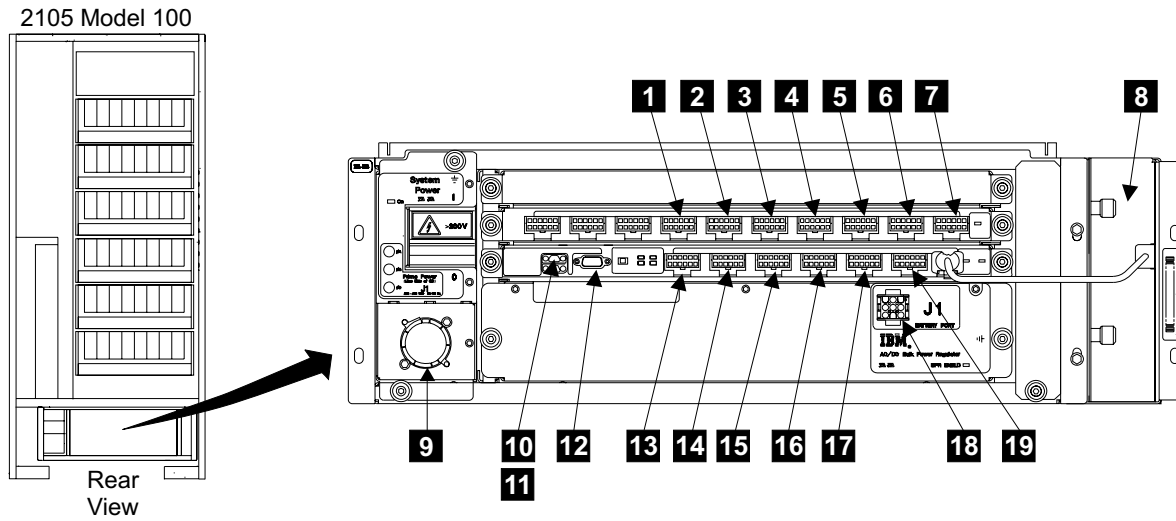
Rear
View

Figure 162. 2105 Model 100 Rear Bulk Power Supply Physical Location Codes (t009034)

350 V Battery Physical Location Codes

1 2105 Model 100 350 V battery (cluster 0) (Rr-V7)
2 2105 Model 100 350 V battery (cluster 1) (Rr-V8)

Note: Rack (Rr) are either rack positions 2 or 3.

2105 Model 100

1 Front
View

2 Rear
View
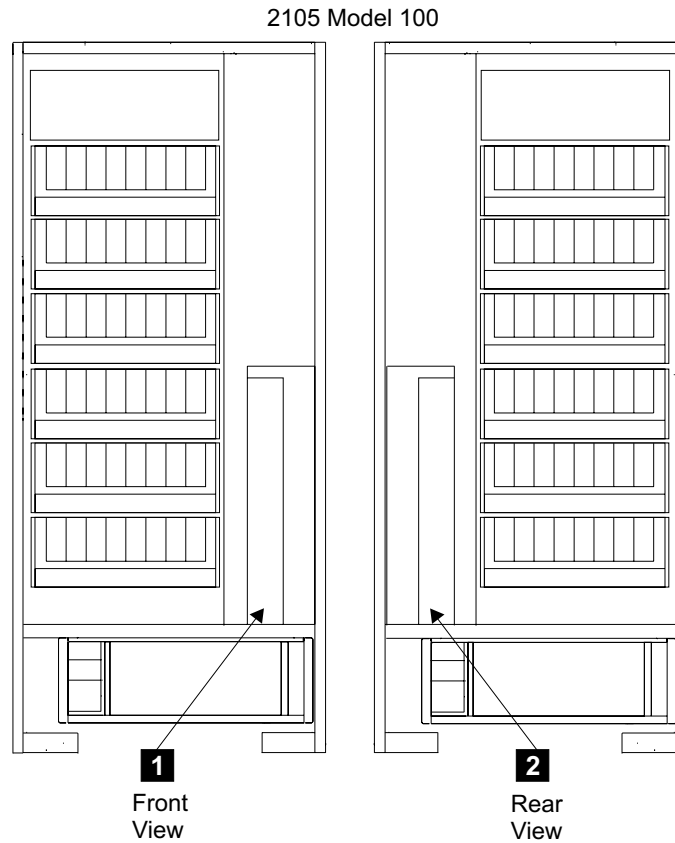
Figure 163. 350 V Battery Physical Location Codes (t009035)

SSA DASD Drawer Physical Location Codes

0 2105 Model 100 device drawer 0 (Y0)
1 2105 Model 100 device drawer 1 (Y1)
2 2105 Model 100 device drawer 2 (Y2)
3 2105 Model 100 device drawer 3 (Y3)
4 2105 Model 100 device drawer 4 (Y4)
5 2105 Model 100 device drawer 5 (Y5)
6 Drawer 6 (Y6), not used when attached to an ESS subsystem

Locations
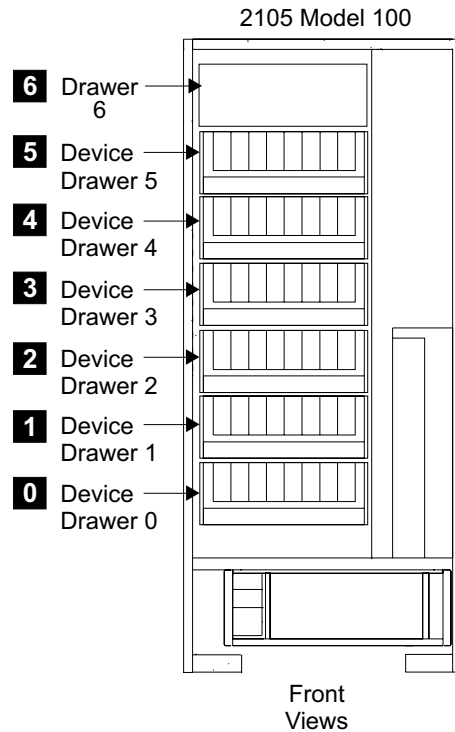
Figure 164. SSA DASD Drawer Standard Logical Location Codes (t009036)

SSA DASD Drawer Disk Drive Module Physical Location Codes

- **1** disk drive module 1 (DRAWERdd-D1)
- **2** disk drive module 2 (DRAWERdd-D2)
- **3** disk drive module 3 (DRAWERdd-D3)
- **4** disk drive module 4 (DRAWERdd-D4)
- **5** disk drive module 5 (DRAWERdd-D5)
- **6** disk drive module 6 (DRAWERdd-D6)
- **7** disk drive module 7 (DRAWERdd-D7)
- **8** disk drive module 8 (DRAWERdd-D8)
- **9** disk drive module 9 (DRAWERdd-D9)
- **10** disk drive module 10 (DRAWERdd-D10)
- **11** disk drive module 11 (DRAWERdd-D11)
- **12** disk drive module 12 (DRAWERdd-D12)
- **13** disk drive module 13 (DRAWERdd-D13)
- **14** disk drive module 14 (DRAWERdd-D14)
- **15** disk drive module 15 (DRAWERdd-D15)
- **16** disk drive module 16 (DRAWERdd-D16)

Note: ″DRAWERdd″ is device drawer 0-5, drawer 6 is not used. For drawer locations, see "SSA DASD Drawer Physical Location Codes" on page 183.
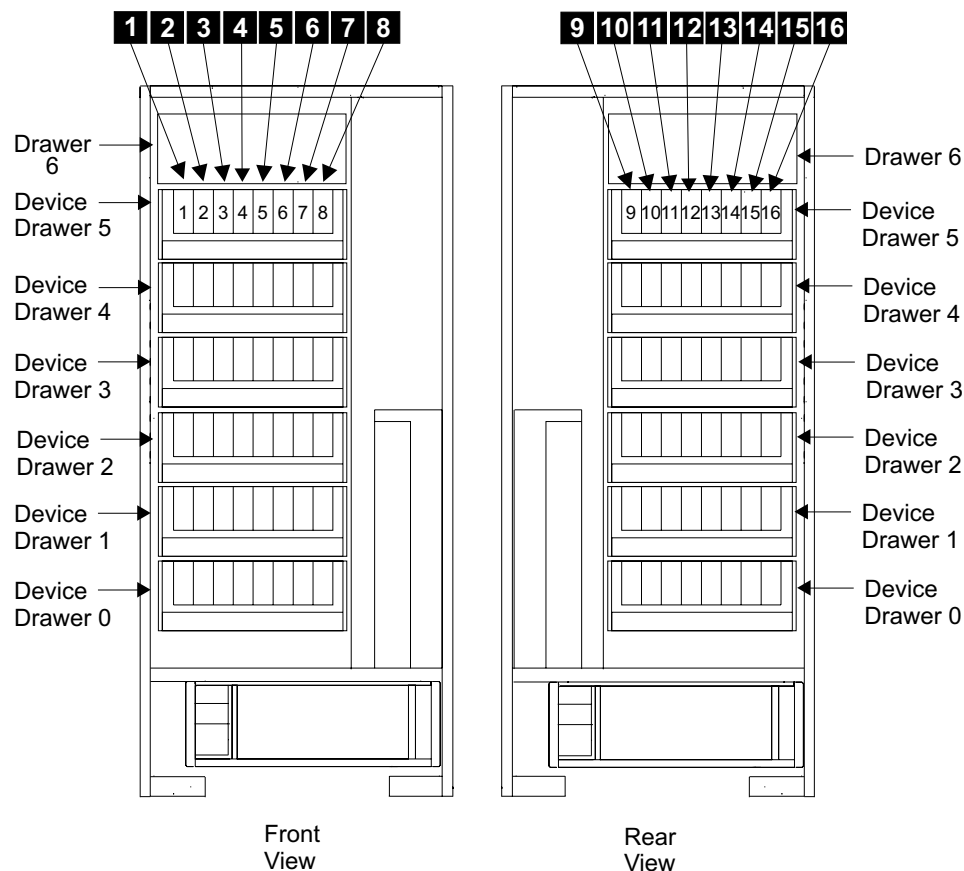
Figure 165. SSA DASD drawer Disk Drive Module Physical Location Codes (t009037)

SSA DASD Drawer Components Physical Location Codes, Model 020 Drawer

1 Drawer power control panel (DRAWERdd-L3)
2 Front backplane assembly (DRAWERdd-P1)
3 Back backplane assembly (DRAWERdd-P2)
4 Bypass card, upper right (model 020)(DRAWERdd-C2)
5 Bypass card, lower right (model 020)(DRAWERdd-C6)
6 Fan-and-power-supply assembly (DRAWERdd-V3)
7 Fan-and-power-supply assembly (DRAWERdd-V2)
8 Fan-and-power-supply assembly (DRAWERdd-V1)
9 Bypass card, upper left (model 020)(DRAWERdd-C1)
10 Bypass card, lower left (model 020)(DRAWERdd-C5)
11 Back-power card (right) (DRAWERdd-C6)
11 Back-power card (left) (DRAWERdd-C5)
12 Power-distribution tray (right) (DRAWERdd-V9)
13 Power-distribution tray (left) (DRAWERdd-V10)

Note: ″DRAWERdd″ is device drawer 0-6. For drawer locations, see "SSA DASD Drawer Physical Location Codes" on page 183.
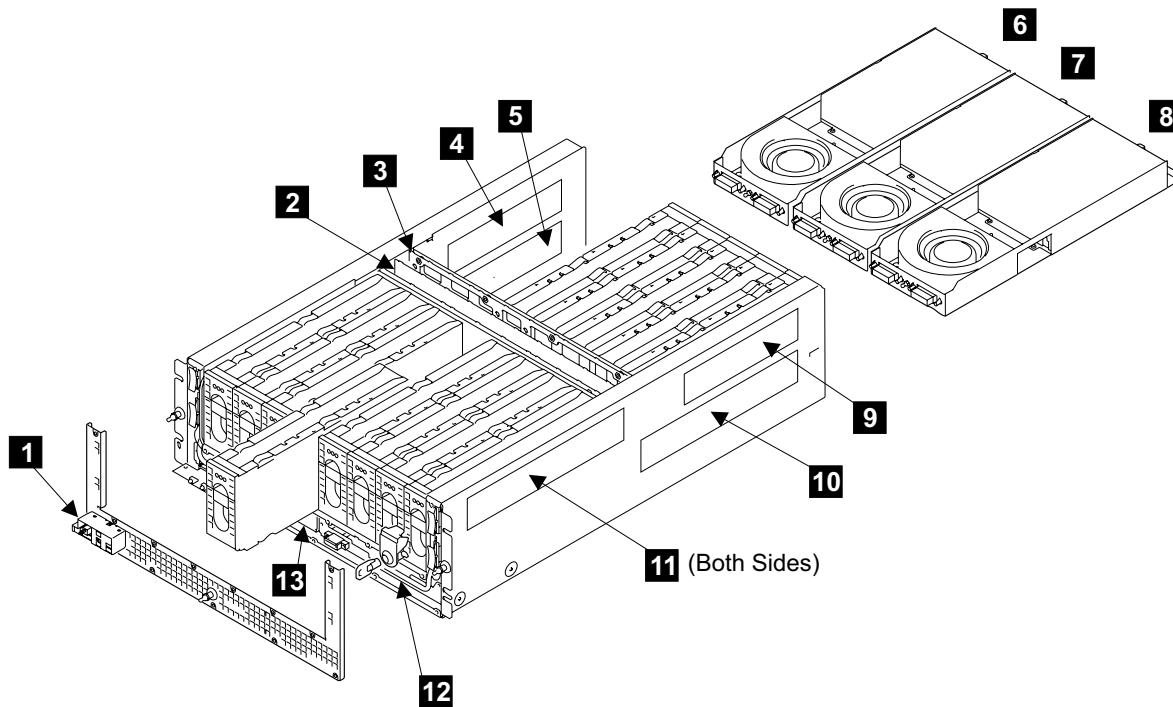
Figure 166. SSA DASD Model 020 Drawer Physical Location Codes (t007165n)

SSA DASD Drawer Components Physical Location Codes, Model 040 Drawer

1 Controller card (DRAWERdd-C5)
2 Bypass card, lower right (DRAWERdd-C6)
3 Bypass card, upper right (DRAWERdd-C2)
4 Frame assembly (DRAWERdd-U40)
5 Power Supply 2 (DRAWERdd-V2)
6 Power Supply 1 (DRAWERdd-V1)
7 Bypass card, upper left (DRAWERdd-C1)
8 Bypass card, lower left (DRAWERdd-C5)
9 Fan, assembly right (DRAWERdd-F3)
10 Fan, assembly center (DRAWERdd-F2)
11 Fan, assembly left (DRAWERdd-F1)
12 Operator panel assembly (The drawer operator panel on 7133 Model 040 drawers is not used during drawer isolation procedures.)

Note: ″DRAWERdd″ is device drawer 0-6. For drawer locations, see "SSA DASD Drawer Physical Location Codes" on page 183.
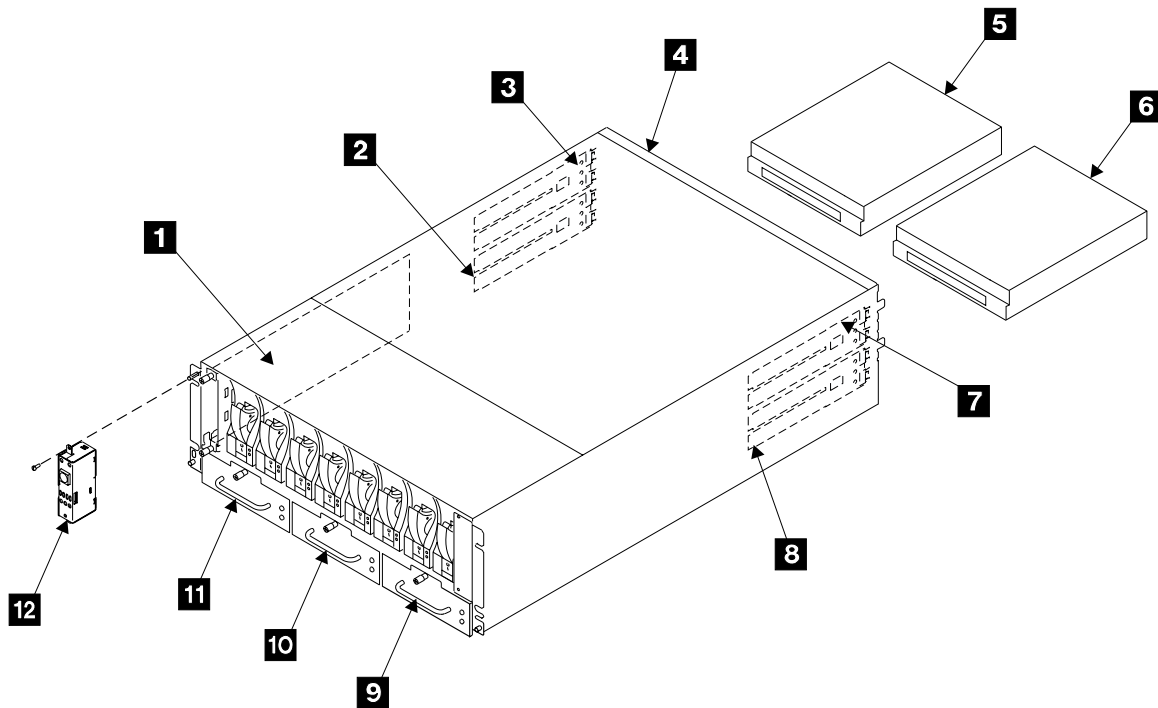
Figure 167. SSA DASD Model 040 Physical Location Codes (t007586n)

Chapter 8. Service Terminal

Service terminal information is available in the service guide for the 2105 Model E20 or F20 that the 2105 Model 100 racks attach to.

Chapter 9. Error Messages, Diagnostic Codes, and Service Reports

Error and progress code information is available in the service guide for the 2105 Model E20 or F20 that the 2105 Model 100 racks attach to.

Chapter 10. Power Distribution Diagrams

2105 System Power Control Diagram
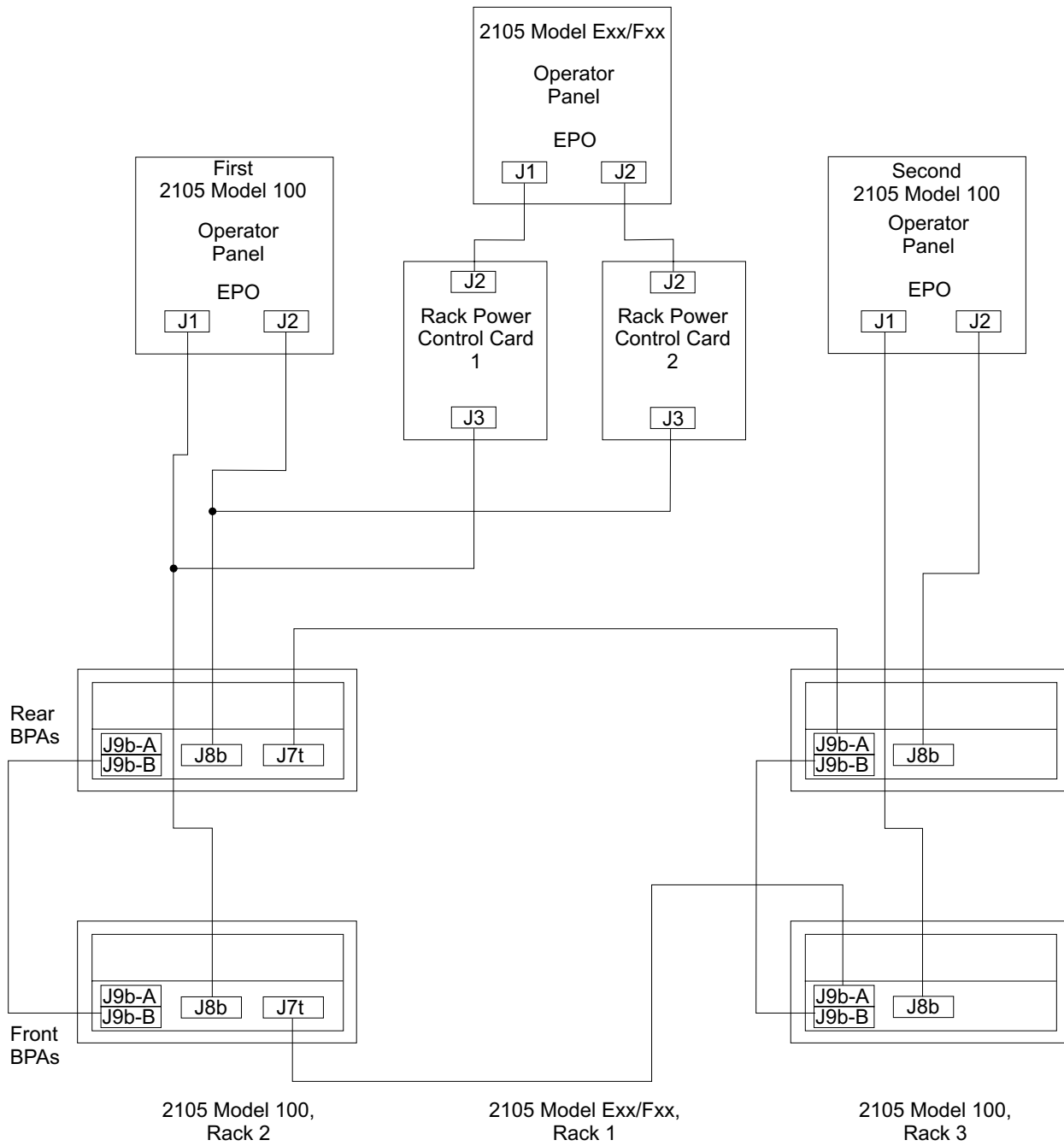
Figure 168. 2105 System Power Control Diagram (t007351r)

2105 With Model 020 Drawers, Earth Ground Diagram
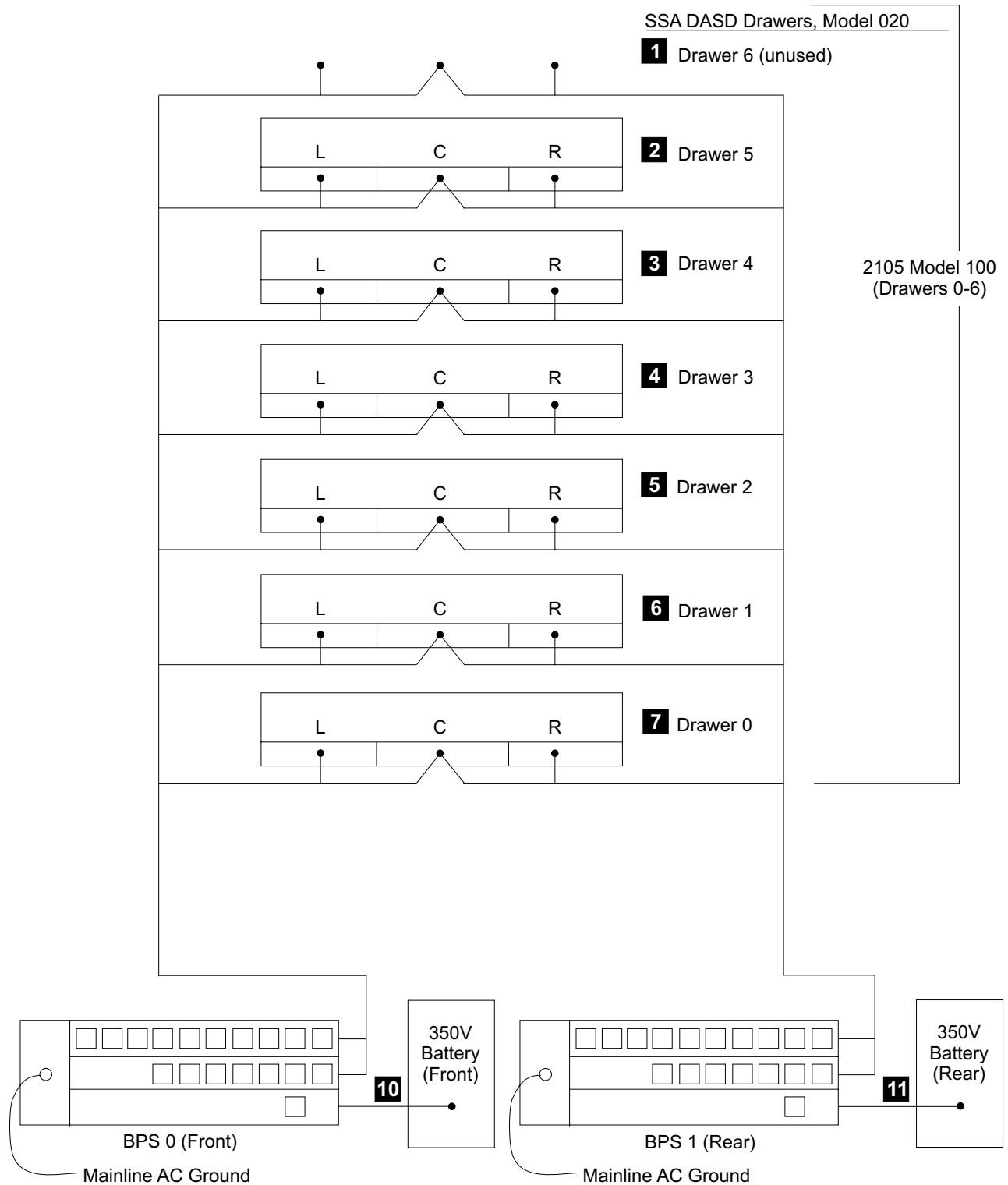
Figure 169. 2105 with Model 020 Drawer, Earth Ground Diagram (t007355s)

2105 With Model 020 Drawers, Earth Ground Diagram

Use the keys in the figure above and the information in Table 18 to determine 2105 Model 100/Model 020 drawer earth grounding paths. To ensure BPS internal grounding, refer to "2105 Bulk Power Supply Component Grounding" on page 199.

2105 With Model 020 Drawers, Earth Ground Table

Table 18. 2105 Model 100 with Model 020 Drawer, Rack Cable Grounding Paths

From Ground Source, BPS Connector and Pins		To Grounded Component
BPS (front)	**BPS (rear)**	
2 **Drawer 5, Drawer Power Cable Grounding Paths** (Model 020 Drawer, three cables)		
J7b, pins 3–4		Left Fan-and-P.S., pin E
	J7b, pins 3–4	Right Fan-and-P.S., pin E
J6t, pins 3–4	J6t, pins 3–4	Center Fan-and-P.S., pin E
3 **Drawer 4, Drawer Power Cable Grounding Paths** ((Model 020 Drawer, three cables)		
J6b, pins 3–4		Left Fan-and-P.S., pin E
	J6b, pins 3–4	Right Fan-and-P.S., pin E
J5t, pins 3–4	J5t, pins 3–4	Center Fan-and-P.S., pin E
4 **Drawer 3, Drawer Power Cable Grounding Paths** (Model 020 Drawer, three cables)		
J5b, pins 3–4		Left Fan-and-P.S., pin E
	J5b, pins 3–4	Right Fan-and-P.S., pin E
J4t, pins 3–4	J4t, pins 3–4	Center Fan-and-P.S., pin E
5 **Drawer 2, Drawer Power Cable Grounding Paths** (Model 020 Drawer, three cables)		
J4b, pins 3–4		Left Fan-and-P.S., pin E
	J4b, pins 3–4	Right Fan-and-P.S., pin E
J3t, pins 3–4	J3t, pins 3–4	Center Fan-and-P.S., pin E
6 **Drawer 1, Drawer Power Cable Grounding Paths** (Model 020 Drawer, three cables)		
J3b, pins 3–4		Left Fan-and-P.S., pin E
	J3b, pins 3–4	Right Fan-and-P.S., pin E
J2t, pins 3–4	J2t, pins 3–4	Center Fan-and-P.S., pin E
7 **Drawer 0, Drawer Power Cable Grounding Paths** (Model 020 Drawer, three cables)		
J2b, pins 3–4		Left Fan-and-P.S., pin E
	J2b, pins 3–4	Right Fan-and-P.S., pin E
J1t, pins 3–4	J1t, pins 3–4	Center Fan-and-P.S., pin E
10 **350 V Battery (Front) Power Cable Grounding Paths** (one cable)		
J1-battery, pin 7		350 V Battery (Front), J1 pin 7
11 **350 V Battery (Rear) Power Cable Grounding Paths** (one cable)		
	J1-battery, pin 7	350 V Battery (Rear), J1 pin 7

2105 With Model 040 Drawers, Earth Ground Diagram
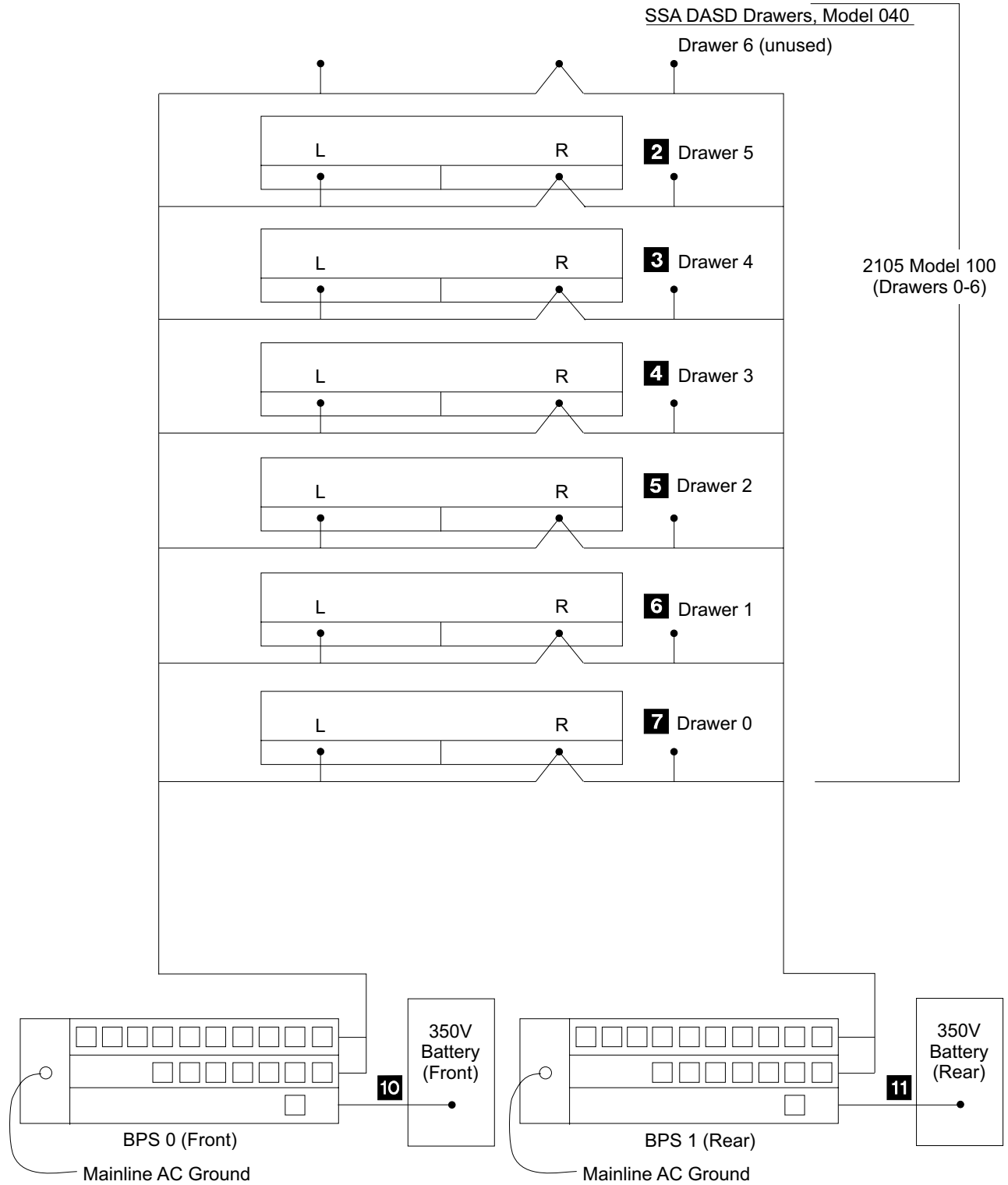
Figure 170. 2105 with Model 040 Drawer, Earth Ground Diagram (t007664s)

2105 With Model 040 Drawers, Earth Ground Diagram

Use the keys in the figure above and the information in Table 19 to determine 2105 Model 100/Model 040 drawer earth grounding paths. To ensure BPS internal grounding, refer to "2105 Bulk Power Supply Component Grounding" on page 199.

2105 With Model 040 Drawers, Earth Ground Table

Table 19. 2105 Model 100 with Model 040 Drawer, Rack Cable Grounding Paths

From Ground Source, BPS Connector and Pins		To Grounded Component
BPS (front)	**BPS (rear)**	
2 **Drawer 5, Drawer Power Cable Grounding Paths** (Model 040 Drawer, two cables used)		
J7b, pins 3–4		Left Fan, pin E
	J7b, pins 3–4	Not Used
J6t, pins 3–4	J6t, pins 3–4	Right Fan, pin E
3 **Drawer 4, Drawer Power Cable Grounding Paths** (Model 040 Drawer, two cables used)		
J6b, pins 3–4		Left Fan, pin E
	J6b, pins 3–4	Not Used
J5t, pins 3–4	J5t, pins 3–4	Right Fan, pin E
4 **Drawer 3, Drawer Power Cable Grounding Paths** (Model 040 Drawer, two cables used)		
J5b, pins 3–4		Left Fan, pin E
	J5b, pins 3–4	Not Used
J4t, pins 3–4	J4t, pins 3–4	Right Fan, pin E
5 **Drawer 2, Drawer Power Cable Grounding Paths** (Model 040 Drawer, two cables used)		
J4b, pins 3–4		Left Fan, pin E
	J4b, pins 3–4	Not Used
J3t, pins 3–4	J3t, pins 3–4	Right Fan, pin E
6 **Drawer 1, Drawer Power Cable Grounding Paths** (Model 040 Drawer, two cables used)		
J3b, pins 3–4		Left Fan, pin E
	J3b, pins 3–4	Not Used
J2t, pins 3–4	J2t, pins 3–4	Right Fan, pin E
7 **Drawer 0, Drawer Power Cable Grounding Paths** (Model 040 Drawer, two cables used)		
J2b, pins 3–4		Left Fan, pin E
	J2b, pins 3–4	Not Used
J1t, pins 3–4	J1t, pins 3–4	Right Fan, pin E
10 **350 V Battery (Front) Power Cable Grounding Paths** (one cable)		
J1-battery, pin 7		350 V Battery (Front), J1 pin 7
11 **350 V Battery (Rear) Power Cable Grounding Paths** (one cable)		
	J1-battery, pin 7	350 V Battery (Rear), J1 pin 7

2105 Bulk Power Supply Component Grounding

The bulk power supply (BPS) assemblies used in the 2105 are made up of multiple components, see "Bulk Power Supply (BPS) Component Locations" on page 174. These power components and the fan are mounted in the bulk power supply with external screws. These screws provide the grounding paths to each of the power components and the fan. To ensure proper BPS ground paths, screws **1**, **2**, **3**, **4**, **5**, and **6** must be tightened to 1.5 to 2.0 newton meters (13 to 18 inch pounds).
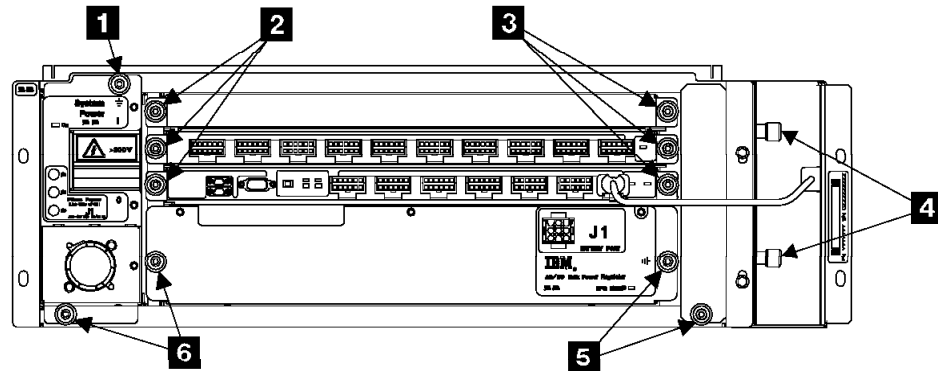
Figure 171. 2105 BPS Component Grounding Screws (t007472l)

Chapter 11. Translation of Cautions and Danger Notices

This section describes the safety notices to follow when servicing a 2105 Model B09 or 2105 Model 100 rack. The translation of these caution and danger notices are provided in a separate document, *IBM Storage Solution Safety Notices* book, GC26-7229.

Examples of Caution and Danger Notices

DANGER

> **Danger notices warn you of conditions or procedures that can result in death or severe injury if you do not take precautions, or if you do not perform procedures exactly as stated.**

CAUTION:
Caution notices warn you of conditions or procedures that can cause injury that is neither lethal nor extremely hazardous, if you do not take precautions, or if you do not perform procedures exactly as stated.

1001

Translation

Chapter 12. Safety Check

Introduction

Attention: This chapter has been translated for use in Germany and Taiwan. These translations are available in the *IBM Storage Solution Safety Notices* book, GC26-7229. They are also available for viewing or printing on the web at **http://www.ibm.com/storage/vss**.

This safety inspection helps you verify the safe condition of a 2105 Model 100 rack and its SSA DASD drawers. Do not service a 2105 rack or SSA DASD drawer with unsafe conditions.

Perform a safety inspection:

- When IBM receives a request for a service agreement for a 2105 rack or SSA DASD drawer.

  Note: Adding previously used 7133 device drawers must be checked for compatibility. Use the ″7133 Model 020 and D40 Requirements for 2105 Installations″ instruction list service offering in the *IBM Enterprise Storage Server Introduction and Planning Guide* book, form number GC26-7294. Adding a previously used 7133 SSA DASD drawer is a *billable service*.

- As part of an alteration-and-attachments review on any 2105 rack or SSA DASD drawer that is on lease, under a service agreement, or on a per-call service.

- On a relocated 2105 rack or SSA DASD drawer.

Preparation

Read the complete safety inspection before you perform any of the steps.

Safety

Record any problems in Table 20.

Table 20. Safety Inspection Problems

Date	Problem Found	Date Corrected

Ensure you complete the *Electrical Safety Training Course for IBM Service Representatives*, number 77170.

Unsafe Conditions

When first assembled, each 2105 rack and SSA DASD drawer has safety equipment installed to protect the operators and service representative from injury. This inspection checklist ensures that all safety equipment and safety labels are installed on the 2105 rack and SSA DASD drawer.

Listed below are some safety conditions and hazards that can be present on the 2105:

- A frame that is not grounded. This can cause a serious or lethal electrical shock.
- Missing safety covers or safety shields. This can be a hazard to the customer and maintenance personnel.

CAUTION:

Do not continue with the inspection if any unsafe conditions are present. (1052)

Reference Items

The following items are supplied with the 2105 Model 100:

- A machine history. If the history is not available, obtain a copy and continue with the inspection.
- The *IBM Versatile Storage Server 2105 Model 100 Attachment to ESS Service Guide*

The following information is not supplied with the 2105:

- *Electrical Safety for IBM Customer Engineers*
- *IBM Input/Output Equipment Installation Manual–Physical Planning*
- The 2105 engineering change announcements (ECAs).

Special Tools

Always perform any power safety checks with a recommended analog meter. Do not use a digital meter when you perform power checks. A digital meter is sensitive to external electrical currents on the low-range scale.

You can also use a ground impedance tester, P/N 6339716 or P/N 6339695, to perform the ground check. Instructions for the tester are in the operating manual.

Continue with the safety inspection procedure:

- For **2105 Model 100**, go to "2105 Model 100 Safety Inspection"

2105 Model 100 Safety Inspection

Safety inspect the 2105 Model 100 by doing the following procedures:

1. "Remove ac Power"
2. "External Machine Check"
3. "Internal Machine Check"
4. "Safety Label Check" on page 206

Remove ac Power

The 2105 Model 100 operates with two mainline power cables. Disconnect both mainline power cables from the 2105 Model 100 before continuing.

Follow these steps to remove ac power.

1. Instruct the customer to switch off the mainline circuit breakers that are used to supply mainline ac voltage to the 2105 Model 100.
2. Attach a "Do Not Operate" tag and a safety lockout padlock to each of the customer's mainline circuit breakers. Refer to the *Electrical Safety for IBM Customer Engineers* book.
3. Disconnect the customer end of both mainline ac power cables.

   For mainline power cables (plug in): Disconnect both mainline ac power cables from the customer's ac mainline power receptacles.

   For mainline power cables (wired): If the mainline power cables were recently rewired or have never been used, disconnect both mainline ac power cables before you continue the safety inspection.

   Instruct the customer to call a licensed electrician to disconnect the mainline ac power cables from the customers mainline ac power.

External Machine Check

Perform the external machine check.

1. Verify that all external covers are present and undamaged.
2. Ensure all latches and hinges are in correct operating condition.
3. Check the 2105 Model 100 for loose, broken, or binding casters.
4. Correct any problems that you find.

Internal Machine Check

Perform the internal machine check.

2105 Model 100 Safety Inspection

1. Check for any non-IBM changes that may 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 any metal or other contaminants, or any indications of water, other fluid, fire, or 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 Check

1. Verify that all safety labels shown in the following steps are installed on the machine. If any safety labels are missing, order and install them.
2. Ensure that the weight safety labels **1** are installed on the front and rear 350 V batteries.

   Universal language   75F7368
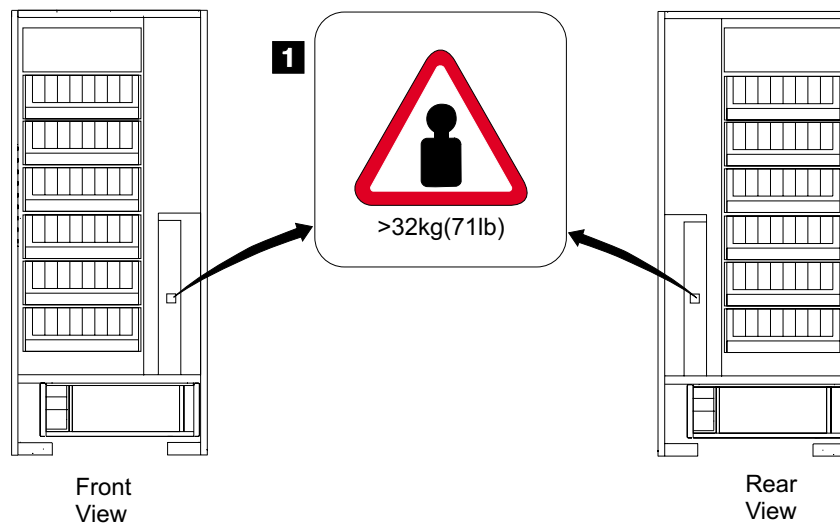
Figure 172. 2105 Model 100 350 V Battery Weight Safety Labels (t007403m)

3. Ensure that the greater than 200 V dc safety labels **2** are installed on the battery end of the front and rear bulk P.S. to 350 V battery cables.

   Universal language, English, French, German, Spanish, Korean, and Brazilian/Portuguese

   P/N 08L8066
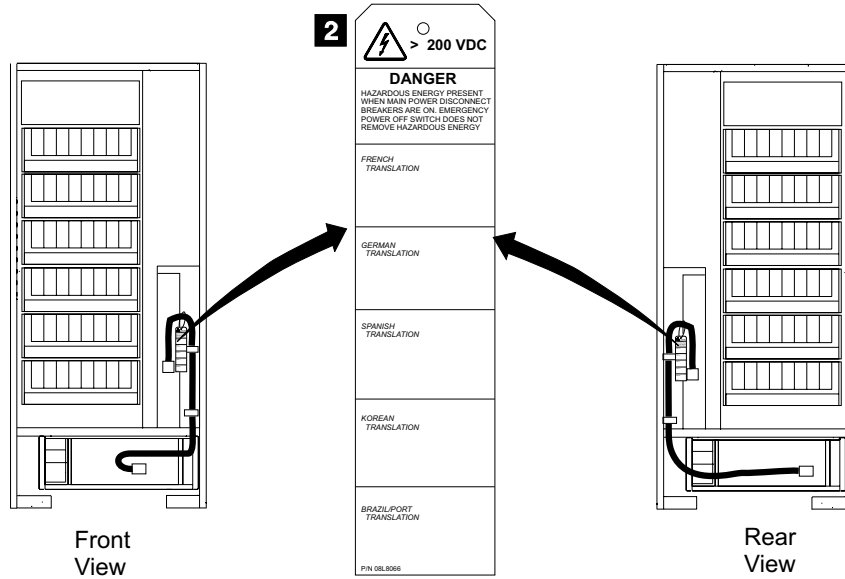
Figure 173. 2105 Model 100, 350 V Battery Cable Voltage Safety Labels (t007483m)

4. Ensure that the dual mainline power cable safety labels are installed on the front and rear tailgate areas of the 2105 Model 100.

   English dual mainline power cable labels (shown) **3** .
   English   P/N 08L8071

   Translated dual mainline power cable labels (not shown) **4** and **5** .
   Brazilian/Portuguese   P/N 08L8115
   French   P/N 08L8111
   German   P/N 08L8109
   Korean   P/N 08L8113
   Spanish   P/N 08L8107
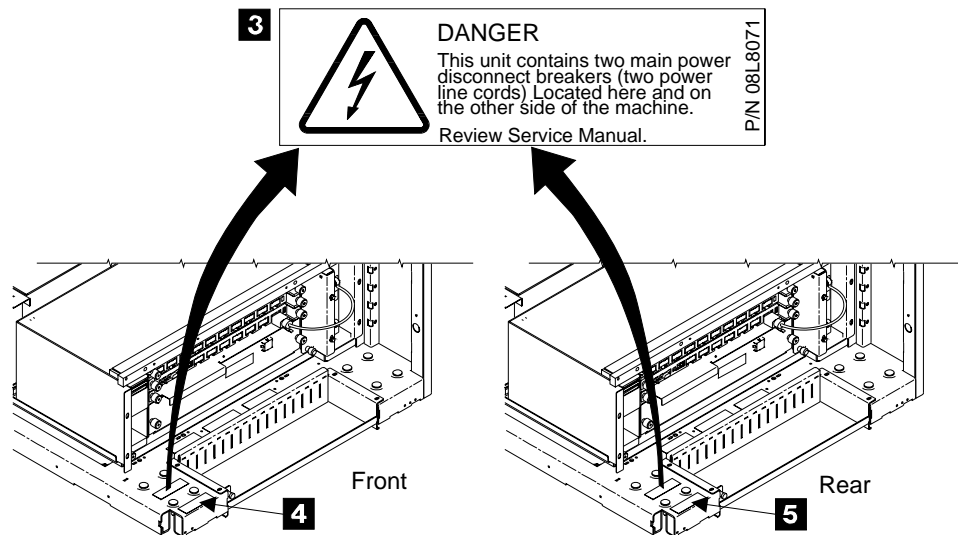
Figure 174. 2105 Model 100 Dual Mainline Power Cable Safety Labels (t007278m)

2105 Model 100 Safety Inspection

5. Ensure that the danger leakage current safety labels are installed on the front and rear tailgate areas of the 2105 Model 100.

   English danger leakage current labels (shown) **6** .
   English   P/N 05J8627

   Translated danger leakage current labels (not shown) **7** and **8** .
   French/Canadian   P/N 05J9071
   French   P/N 05J9071
   German   P/N 05J9065
   Korean   P/N 05J9079
   Spanish   P/N 05J9063
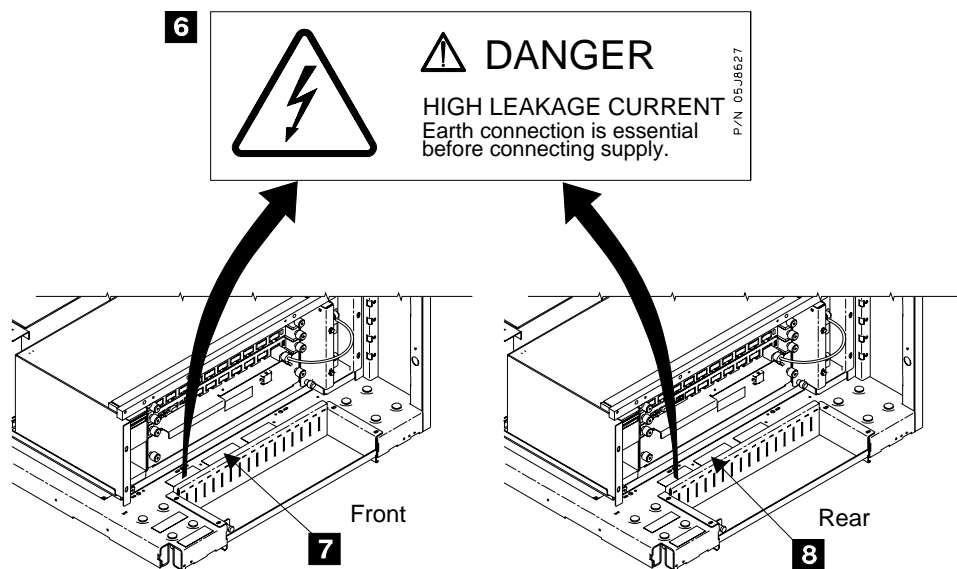
Figure 175. 2105 Model 100 Danger Leakage Current Safety Labels (t007279m)

6. Ensure that the greater than 300 V dc safety labels **9** are installed on the front and rear bulk power supplies.

   Universal language   P/N 08L8069
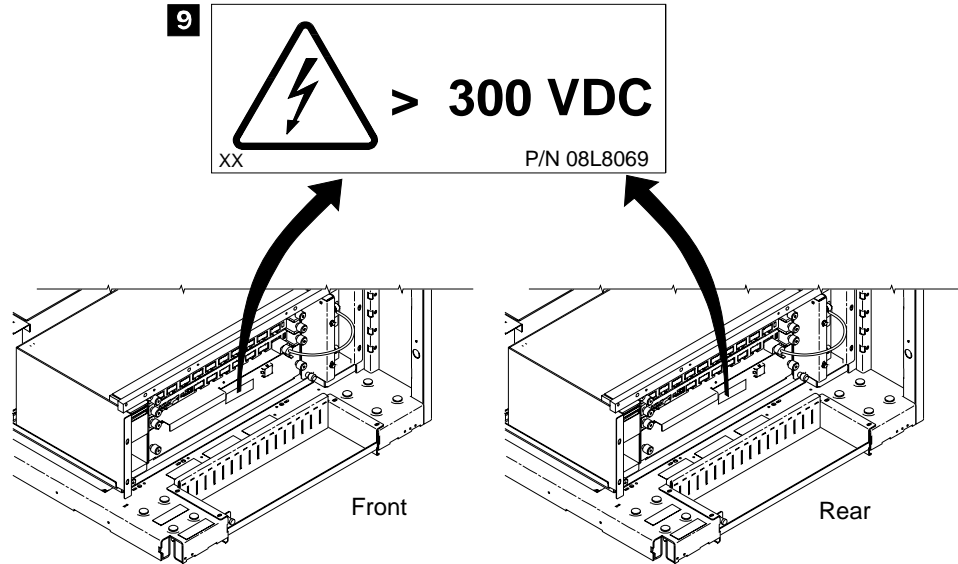
Figure 176. 2105 Model 100 Bulk Power Supply Safety Label (t007481m)

7. If necessary, ensure that the Unit Emergency switch portion of the translated operator panel **10** is installed on the 2105 Model 100.

Belgian/Dutch	P/N 05J8148
Brazilian/Portuguese	P/N 05J8147
Chinese, Simplified (PROC)	P/N 05J8145
Chinese, Traditional (ROC)	P/N 05J8144
English	P/N 05J7373
French	P/N 05J8138
German	P/N 05J8140
Italian	P/N 05J8143
Japanese	P/N 05J8141
Korean	P/N 05J8139
Portuguese	P/N 93G1146
Spanish	P/N 05J8142

2105 Model 100 Safety Inspection

Power Complete

Line Cord 0
Line Cord 1

Unit
Emergency

10
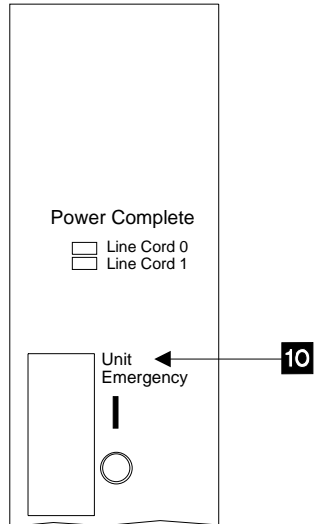
Figure 177. 2105 Model 100 Operator Panel Label (t007400m)

8. Read the following Danger notice before continuing.

DANGER

> **Customers can be exposed to lethal AC voltages if the mainline power cable retention plates are not installed. The front and rear mainline power cable retention plates must be installed before the machine is returned to the customer. (1010)**

a. Ensure that the mainline power cable retention plates **11** are installed on the front and rear bulk power supplies.

b. Verify that the ground strap **13** on each mainline power cable is held under the retention plate **11** by the lower mounting screw **12** .

c. Verify that the greater than 200 V ac safety labels **14** are present on both mainline power cables.

Universal language, English, French, and German
P/N 08L8011
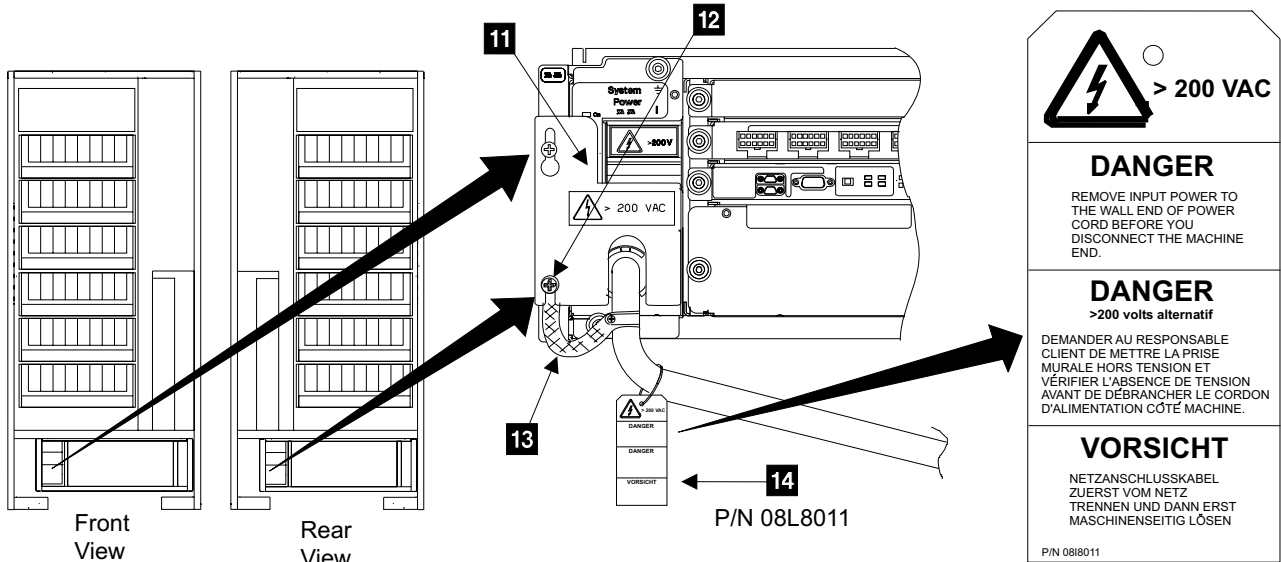
Figure 178. 2105 Model 100, Mainline Power Cable Safety (t007464m)

9. Ensure that the greater than 200 V ac safety labels **16** are present on the retention plates **15** mounted on the front and rear bulk power supplies.

   Universal language   P/N 93G2622
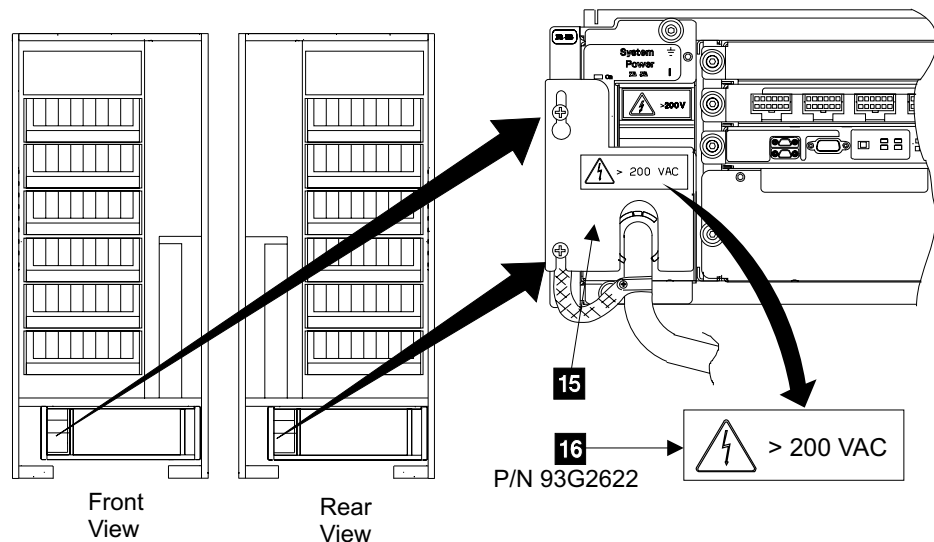
Figure 179. 2105 Model 100, Mainline Power Cable Retention Plate Safety Label (t007401m)

10. Ensure that the cover weight safety label **17** . is installed on the inside of the front cover

   Universal language   P/N 5423461
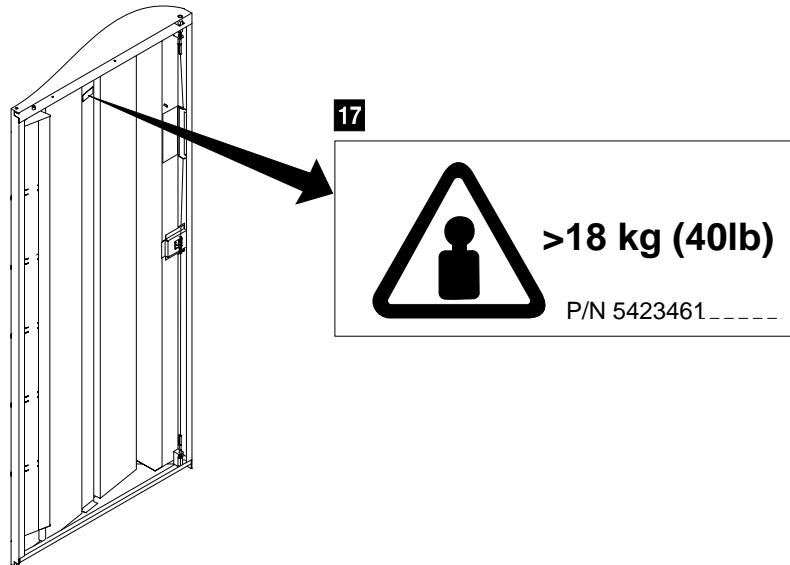
Figure 180. 2105 Model 100 Front Cover Weight Safety Label (t007485m)

11. Verify that the ground strap is fastened to the 2105 Model 100 frame with lock washers between both cable terminals and the frame `18`.

> **Note:** The ground strap may be fastened to left side of the 2105 Model 100 frame in the same position.
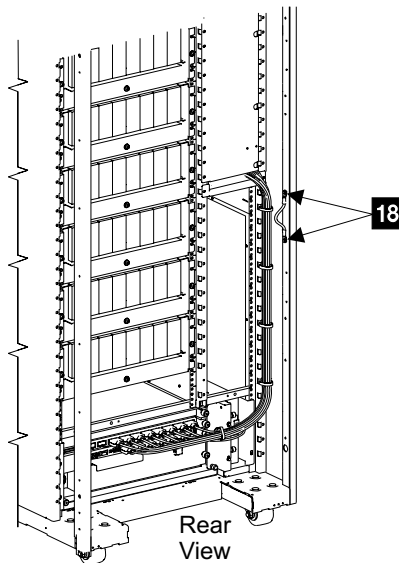
Figure 181. 2105 Model 100 Ground Strap Location (t007477m)

12. Complete the safety inspection by going to "Safety Engineering Changes".

Safety Engineering Changes

1. Ensure all safety engineering changes (ECs) are installed.
2. Reinstall all removed covers.

3. This completes the visual and mechanical safety inspection procedures with the power off.

CAUTION:

Do not attempt to switch on power to the machine until all unsafe conditions are corrected. (1050)

CAUTION:

Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements. (1051)

Perform one of the following:
- Installation:

  Return to "Chapter 5. Install and Remove" on page 93.
- Relocate or discontinue:
  1. Perform the electrical safety checks. See "Checking the Customers Power" on page 104 through "Check the Customer's Circuit Breaker with the Power On" on page 111.
  2. Return to "Chapter 5. Install and Remove" on page 93 when the electrical safety checks are complete.

Glossary of Terms and Abbreviations

This glossary defines important terms and abbreviations used in this service guide. If you cannot find the term you are looking for, see the Index or the *IBM Dictionary of Computing*

This glossary includes terms and definitions from:

- The *American National Dictionary for Information Systems,* ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies may be purchased from the American National Standards Institute, 11 West 42 Street, New York, New York 10036. Definitions are identified by the symbol (A) after the definition.
- The ANSI/EIA Standard—440-A: *Fiber Optic Terminology.* Copies may be purchased from the Electronic Industries Association, 2001 Pennsylvania Avenue, N.W., Washington DC 20006. Definitions are identified by the symbol (E) after the definition.
- The *Information Technology Vocabulary,* developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC1/SC1). Definitions of published parts of this vocabulary are identified by the symbol (I) after the definition; definitions taken from draft international standards, committee drafts, and working papers being developed by ISO/IEC JTC1/SC1 are identified by the symbol (T) after the definition, indicating that final agreement has not yet been reached among the participating National Bodies of SC1.

A

access. (1) To obtain the use of a computer resource. (2) In computer security, a specific type of interaction between a subject and an object that results in flow of information from one to the other.

alert. A message or log that a storage facility generates as the result of error event collection and analysis. An alert indicates that you need to perform some service action.

allegiance. The ESA/390 term for a relationship that is created between a device and one or more channel paths during the processing of certain conditions. Refer to implicit allegiance, contingent allegiance, and reserved allegiance.

ANSI. American National Standards Institute. A standards committee body for the United States.

array. An arrangement of related disk drive modules that you have assigned to a group.

ASCII. American national Standard Code for Information Interchange. A coding scheme defined by ANSI X3.4-1977 which is used to represent various alphabetic, numeric, and special symbols with a seven-bit code.

availability. The degree to which a system or resource is capable of performing its normal function.

B

BIST. Built-In Self-Test.

bit. binary digit. The storage medium required to store a single binary digit.

block. A group of consecutive bytes.

boot. To load an operating system or start the system.

BOS. Base Operating System.

BPS. Bulk Power Supply

Bulk Power Supply (BPS). A primary power supply that attaches customer AC input power, generates and distributes 350 V dc, and controls and monitors associated power functions.

byte. An aggregation of eight bits. The storage medium required to store eight bits.

C

cache (memory). Typically refers to volatile memory used to improve access times on data or instructions accesses. The cache memory is typically smaller and faster than the primary memory or storage medium. On a storage facility, the cache memory is used to improve the performance of accesses to data that ultimately resides on the storage devices in the storage facility.

cache fast write. A form of fast write where the subsystem writes the data directly to cache, where it is available for later destaging.

CCR. Channel Command Retry.

CCW. Channel Command Word. The ESA/390 term for a data structure that is used to specify an I/O operation to the channel subsystem.

CD-ROM. Compact Disc Read-Only Memory.

CEC. Computer Electronic Complex. The set of hardware facilities associated with a host computer.

channel. The ESA/390 term for the part of a channel subsystem that manages a single I/O interface between a channel subsystem and a set of control units.

Channel-Command Retry (CCR). An ESA/390 term for a protocol used between a channel and a control unit which allows the control unit to request that the current command be reissued.

channel path. The ESA/390 term for the interconnection between a channel and its associated control units.

channel subsystem. The ESA/390 term for the part of a host computer that manages I/O communication between the program and any attached control units.

channel-subsystem image. The ESA/390 term for the logical facilities required to perform the function of a channel subsystem. With EMIF, one channel-subsystem image exists in the channel subsystem for each LPAR. Each image appears to be an independent channel subsystem program, but all images share a common set of hardware facilities.

CKD. Count Key Data. An ESA/390 architecture for a DASD logical device that specifies the format of and access mechanisms for the logical data units on the device. The logical data unit is a track which can contain one or more records, each consisting of a count field, a key field (optional), and a data field (optional).

cluster. A partition of a storage controller that is capable of performing all functions of a storage server. Multiple clusters provide redundancy.

concurrent copy. A facility of a storage controller used to assist a program in making a consistent copy of a logical volume while the logical volume remains available for subsequent processing.

concurrent maintenance. The ability to service a unit while it is operating.

concurrent media maintenance. The ability to perform maintenance on a disk drive module (DDM) without loosing access to the data.

configure. To define the logical and physical configuration of the input/output (I/O) subsystem via the user interface provided for this function on the storage facility.

consistent copy. A copy of a data entity (e.g. a logical volume) that contains the contents of the entire data entity from a single instant in time.

contingent allegiance. The ESA/390 term for a relationship that is created in a control unit between a device and a channel path when unit-check status is accepted by the channel. The allegiance causes the control unit to guarantee access (i.e. busy status is not presented) to the device to retrieve the sense data associated with the unit-check status on the channel path associated with the allegiance.

control unit. The ESA/390 term for a storage controller with ESCON or OEMI interfaces.

control-unit image. The ESA/390 term for a logical subsystem accessed via an ESCON I/O Interface. One or more control-unit images exist in each control unit. Each image appears to be an independent control unit, but all images share a common set of hardware facilities.

count field. The first field of a CKD record. The eight-byte field contains a four-byte track address (CCHH) that defines the cylinder and head associated with the track, a one-byte record number (R) that identifies the record on the track, a one-byte key length that specifies the length of the record's key field (0 means no key field), and a two-byte data length that specifies the length of the record's data field (0 means no data field). Only the end-of-file record has a data length of zero.

CPAR. Customer Problem Analysis and Repair.

CPI. Common Platform Interconnect.

CPSS. Common Platform Storage Subsystems. A strategy and family of storage products based on common hardware parts.

CRC. Cyclic Redundancy Check.

CSU. Customer Set Up.

Customer Console. A user interface to a server. Also see Versatile Storage Specialist.

Cyclic Redundancy Check (CRC). A data redundancy check in which a cyclic algorithm generates the check key.

cylinder. A unit of storage on a CKD device consisting of a fixed number of tracks.

D

DA. Device Adapter, the SSA device card.

daisy chain. A method of device interconnection for determining interrupt priority by connecting the interrupt sources serially.

DASD. Direct Access Storage Device.

DASD fast write. A facility of a storage controller that allows caching of active write data without exposure of data loss by journaling of the active write data in NVS.

data availability. The degree to which data is available when needed. For better data availability when you attach multiple hosts that share the same data storage, configure the data paths so the data transfer rates are balanced among the hosts.

data compression. A technique or algorithm used to encode a quantity of data such that the encoded result can generally be stored in less space than the original data and such that the original data can be recovered from the encoded result through a reverse technique or reverse algorithm.

data field. The third (optional) field of a CKD record. The field length is determined by the data length specified in the count field. The data field contains data written by the program.

data record. A data records are stored on a track following the track-descriptor record. The data records are numbered consecutively starting with 1. A maximum of 255 data records can be stored on a track. Each data record consists of a count field, a key field (optional), and a data field (optional).

data sharing. The ability of the similar or different host systems to concurrently utilize information that they store on one or more storage devices. The storage facility allows configured storage to be accessible to any attached host systems, or to all. To use this capability, the host programs need to be designed to support data sharing.

dedicated storage. Storage within a storage facility that is configured so that a single host has exclusive access to the storage.

demote. The action of removing a logical data unit from cache memory. A data unit is demoted in order to make room for other logical data units in the cache or because the logical data unit was invalidated. Logical data units with active write unit must be destaged before being demoted.

destage. (1) The process of reading data from cache. (2) The action of storing a logical data unit in cache memory with active write data to the storage device. As a result, the logical data unit changes from cached active write data to cached read data.

device. The ESA/390 term for a logical device.

Device Adapter (DA). A physical sub-unit of a storage controller, the SSA device card, that provides the facilities to attach to one or more interfaces used to communicate with the associated storage devices.

device address. The ESA/390 term for the field of an ESCON device-level frame that selects a specific device on a control-unit image.

device interface card. A physical sub unit of a storage cluster that provides the communication with the attached DDMs.

device number. The ESA/390 term for a four-hexadecimal-character identifier (e.g. X'13A0') associated with a device to facilitate communication between the program and the host operator. The device number is associated with a subchannel.

device sparing. When a subsystem automatically copies data from a failing DDM to a spare DDM. The subsystem maintains data access during the process

disk drive. The mechanism used to seek, read, and write information on a disk.

disk drive module. The primary nonvolatile storage medium that you use for any host data that is stored within a subsystem. Number and type of storage devices within a storage facility may vary.

drawer. A unit that contains multiple DDMs, and provides power, cooling, and related interconnection logic to make the DDMs accessible to the attached host systems.

E

EBCDIC. Extended Binary-Coded Decimal Interchange Code. A coding scheme developed by IBM which is used to represent various alphabetic, numeric, and special symbols with an 8 bit code.

EC. Engineering Change. A update to a machine, part, or program. Each EC for a given unit is assigned a unique number referred to as an EC level or EC number. The initial release of a unit normally has an associated EC level.

ECC. Error Correction Code.

ECKD. Extended Count Key Data. An extension of the CKD architecture.

electrostatic discharge (ESD). An undesirable discharge of static electricity that can damage equipment and degrade electrical circuitry.

EMIF. ESCON Multiple Image Facility. An ESA/390 facility that allows LPARs to share an ESCON channel path by providing each LPAR with its own channel-subsystem image.

enclosure. See *rack*.

end-of-file record. On a CKD DASD device, end of file is indicated by a record with a data length of zero.

EPOW. Early Power-Off Warning.

EPROM. Erasable Programmable Read-Only Memory.

ERP. Error Recovery Procedure.

Exception Symptom Code (ESC). A two byte error code that describes the exception: class, type, and symptom.

ESA/390. Enterprise Systems Architecture/390. An IBM architecture for mainframe computers and peripherals. Processor systems following this architecture include the ES/9000 family.

ESC. Exception Symptom Code.

ESCON. Enterprise Systems Connection Architecture. An ESA/390 computer peripheral interface. The I/O interface utilizes ESA/390 logical protocols over a serial interface that configures attached units to a communication fabric.

ESCON director. A I/O interface switch that allows the interconnection of multiple ESCON interfaces in a distributed-star topology.

ESD. ElectroStatic Discharge.

extended remote copy. A facility of a storage controller that assists a control program to maintain a consistent copy of a logical volume on another storage facility. All modifications of the primary logical volume by any attached host are presented in order to a single host which in turn makes these modifications on the secondary logical volume.

F

failback. Cluster recovery from failover following repair. Also see *cluster*.

failover. The routing of all transactions to a second controller when the first controller fails. Also see *cluster*.

fast write. A write operation at cache speed that does not require immediate transfer of data to a DDM. The subsystem writes the data directly to cache, to nonvolatile storage, or to both. The data is then available for destaging. Fast write reduces the time an application must wait for the I/O operation to complete.

FBA. Fixed Block Address. An architecture for DASD logical devices that specifies the format of and access mechanisms for the logical data units on the device. The logical data unit is a block. All blocks on the device are the same size (i.e. fixed) and can be accessed independently,

FC-AL. Fibre Channel - Arbitrated Loop. An implementation of the fibre channel standard that uses a ring topology for the communication fabric. Reference ANSI X3T11/93-275.

FCS. Fibre Channel Standard.

Fibre Channel Standard (FCS). An ANSI standard for a computer peripheral interface. The I/O interface defines a protocol for communication over a serial interface that configures attached units to a communication fabric. The protocol is defined in two layers. The IP layer defines basic interconnection protocols. The upper layer supports one or more logical protocols (e.g. FCP for SCSI command protocols, SBCON for ESA/390 command protocols). Reference ANSI X3.230-199x.

FIFO. First-In First-Out.

firmware. An ordered set of microcode instructions and data stored in a hardware EPROM. When microcode software is installed into a hardware EPROM, it becomes firmware. Firmware cannot be modified by the user but can be updated by the service personnel.

First-In First-Out (FIFO). A queuing technique in which the next item to be retrieved is the item that has been in the queue for the longest time.

FRU. Field-Replaceable Unit.

H

HA. Home Address, Host Adapter.

hard drive. A storage medium within a storage server used to maintain information that the storage server requires.

HDA. Head and Disk Assembly. The portion of a HDD associated with the medium and the read/write head.

HDD. Head and Disk Device. A disk drive.

hdisk. An AIX term for storage space.

Home Address (HA). A nine-byte field at the beginning of a track that contains information identifying the physical track and its association with a cylinder.

host. A computer.

host adapter. A physical sub-unit of a storage controller, ultra SCSI host card, that provides the facilities to attach to one or more host I/O interfaces.

host system. A computer.

hot plug. The ability to add or remove a hardware facility, resource, or FRU to a unit while its power is on.

I

ID. IDentifier.

identifier (ID). A unique name or address that identifies such things as programs, devices, or systems.

IML. Initial Microcode Load

implicit allegiance. The ESA/390 term for a relationship that is created in a control unit between a device and a channel path, or path group, when an I/O operation is accepted by the device. The allegiance causes the control unit to guarantee access (i.e. busy status is not presented) to the device for the remainder of the channel program over the set of channel paths associated with the allegiance.

initiator. A SCSI term for the part of a host computer that communicates with its attached targets.

interchange. The sending and receiving of data in such a manner that the content of the data is not altered during transmission.

invalidate. The action of removing a logical data unit from cache memory because it cannot support continued access to the logical data unit on the logical device. The removal may be the result of a failure within the storage controller or a storage device associated with the logical device.

I/O. Input/Output.

I/O device. An addressable read and write unit, such as a disk drive device, magnetic tape device, or printer.

I/O interface. An interface defined to allow input/output operations to be performed between a host and its associated peripheral devices.

IOA. I/O Attachment Card

IOM. 4-Slot Bay Planar

IOCC. Input/Output Channel Controller

IP. Internet Protocol.

IPL. Initial Program Load

K

KB. KiloByte.

key field. The second (optional) field of a CKD record. The field length is determined by the key length specified in the count field. The key field contains data written by the program that can be used to identify or locate a given record.

kilobyte (KB). A kilobyte of storage is 10³ bytes. A kilobyte of memory is 2¹⁰ bytes.

KPOH. Kilo (1000) of Power-On Hours. A unit of time used for a measurement of MTBF.

L

LAN. Local Area Network.

Last-In First-Out (LIFO). A queuing technique in which the next item to be retrieved is the item that has been most recently placed in the queue.

LBA. Logical Block Address

Least Recently Used (LRU). The algorithm used to identify and make available the cache space that contains the least-recently used data.

LED. Light-Emitting Diode.

LIC. Licensed Internal Code.

Licensed Internal Code (LIC). Microcode that IBM does not sell as part of a machine but licenses to the customer, as designated in the Supplement to Agreement for Purchase of IBM Machines. See *microcode*.

LIFO. Last-In First-Out.

Light Emitting Diode (LED). A semiconductor chip that gives off visible or infrared light when it is activated.

link address. On an ESCON interface, the portion of a source or destination address in a frame that ESCON uses to route a frame through an ESCON director. ESCON associates the link address with a specific switch port that is on the ESCON director.Equivalently, it associates the link address with the channel-subsystem, or control-unit link-level functions that are attached to the switch port.

link-level facility. An ESCON term for the hardware and logical facilities of a control unit or channel subsystem that allows communication over an ESCON write interface and an ESCON read interface.

Local Area Network (LAN). A computer network located at a user's site within a limited area.

logical address. On an ESCON interface, the portion of a source or destination address in a frame used to select a specific channel-subsystem or control-unit image.

logical data unit. A unit of storage which is accessible on a given logical device.

logical device. The facilities of a logical subsystem that the host communicates with when performing I/O operations to a single addressable-unit over an I/O interface. The same logical device may be accessible over more than one I/O interface.

logical partition mode (LPAR). The ESA/390 term for a set of facilities that create the programming environment defined by the ESA/390 architecture. The term is typically used when there is more than one LPAR established on a CEC. An LPAR is conceptually similar to a virtual machine environment except that the

LPAR is a function of the CEC and is not dependent on an operating system to create the virtual machine environment.

logical subsystem.   The logical functions of a storage controller that allow one or more host I/O interfaces to access a set of logical devices. The controller aggregates the devices according to the addressing mechanisms of the associated I/O interfaces. One or more logical subsystems exist on a storage controller. In general, a given set of logical devices is associated with one and only one logical subsystem.

logical unit.   The SCSI term for a logical device.

Logical Unit Number (LUN).   The SCSI term for the field in an Identify message that is used to select a logical unit on a given target.

logical volume.   The storage medium associated with a logical disk drive. A logical volume typically resides on one or more storage devices. For the 2105, you define this unit of storage; the logical volume resides on a RAID-5 array, and is spread over 6 + P or 7 + P drives.

LPAR.   Logical PARtition mode.

LRU.   Least Recently Used.

LUN.   Logical Unit Number.

M

Maintenance Analysis Procedure (MAP).   Service personnel use these procedures during maintenance on a subsystem.

MAP.   Maintenance Analysis Procedure.

MB.   MegaByte.

MCA.   Micro-Channel Architecture.

medium.   For a storage facility, this is the disk surface on which data is stored.

megabyte (MB).   A megabyte of storage is 10^6 bytes. A megabyte of memory is 2^{20} bytes.

MIB.   Management Information Base.

microcode.   Stored microinstructions, not available to users, that perform certain functions. See *firmware*.

mirrored pair.   Two units that contain the same data. The system refers to them as one entity.

mirroring.   In AS/400 systems, the process of writing the same data to two disk units within the same auxiliary storage pool at the same time.

MLC.   Machine-Level Control. A data bases that maintains the EC level and configuration of products in the field.

MTBF.   Mean Time Between Failures. A projection of the time that an individual unit will remain functional based on averaging the performance or projected performance of a population of statistically independent units under as set of operating conditions or assumptions.

N

ND.   Node Descriptor.

NED.   Node-Element Descriptor.

NEQ.   Node-Element Qualifier.

nondisruptive.   The attribute of an action or activity that does not result in the loss of any existing capability or resource, from the customer's view.

non-removable medium.   Recording media that cannot be added to or removed from a storage device.

non-retentive data.   Data that the control program can easily recreated in the event it is lost. The control program may cache non-retentive write data in volatile memory.

Non-Volatile Storage (NVS).   Typically refers to non-volatile memory on a processor rather than a non-volatile storage device. On a storage facility, non-volatile storage is used to store active write data to avoid data loss in the event of a power loss.

NQ.   Node Qualifier.

NVRAM.   NonVolatile Random Access Memory

NVS.   Non-Volatile Storage.

O

OEMI.   Original Equipment Manufacturer's Information. A reference to an IBM standard for a computer peripheral interface. More specifically, a reference to *IBM S/360 and S/370 Channel to Control Unit Original Equipment Manufacture's Information* The interface utilizes ESA/390 logical protocols over an I/O interface that configures attached units in a multi-drop bus topology.

open system.   A system whose characteristics comply with standards made available throughout the industry, and therefore can be connected to other systems that comply with the same standards.

P

parity.   A data checking scheme used in a computer system to ensure the integrity of the data. The RAID implementation uses parity to recreate data if a disk drive fails.

path group. The ESA/390 term for a set of channel paths that are defined to a controller as being associated with a single LPAR. The channel paths are in a group state and are online to the host.

path-group identifier. The ESA/390 term for the identifier that uniquely identifies a given LPAR. The path-group identifier is used in communication between the LPAR program and a device to associate the path-group identifier with one or more channel paths, thereby defining these paths to the control unit as being associated with the same LPAR.

PCI. Program-Controlled Interrupt, Peripheral-Component Interconnect.

Peer to Peer Remote Copy (PPRC). A function of a storage controller that maintains a consistent copy of a logical volume on the same controller or on another controller. The controllers are accessed over an ESCON I/O interface. All modifications that any attached host performs on the primary logical volume, they also perform on the secondary logical volume. Options exist to request the modifications to be performed synchronously (i.e. before the completion of the modification of the primary copy is are completed).

POST. Power On Self Test.

PPRC. Peer to Peer Remote Copy.

predictable write. A write operation that can cached without knowledge of the existing formatting on the medium. All writes on FBA DASD devices are predictable. On CKD DASD devices, a write is predictable if it does a format write for the first data record on the track.

program. A generic term for the software that controls the operation of a host computer. Typically, the program is an operating system that allows sharing of the host resources between multiple tasks.

promote. The action of adding a logical data unit to cache memory.

R

rack. A unit that houses the components of a storage subsystem, such as controllers, disk drives, and power.

RAID. Redundant Array of Independent Disks. See *array*.

RAM. Random Access Memory.

random access. A mode of accessing data on a medium in a manner that requires the storage device to access non-consecutive storage locations on the medium.

reserved allegiance. The ESA/390 term for a relationship that is created in a control unit between a

device and a channel path, when a Sense Reserve command is completed by the device. The allegiance causes the control unit to guarantee access (busy status is not presented) to the device. Access is over the set of channel paths that are associated with the allegiance; access is for one or more channel programs, until the allegiance ends.

ROM. Read-Only Memory.

R0. track-descriptor record.

S

SBCON. Single-Byte command code Sets CONnection architecture. An ANSI standard draft for the ESCON I/O interface.

SCSI. Small Computer System Interface. An ANSI standard for a logical interface to computer peripherals and for a computer peripheral interface. The interface utilizes a SCSI logical protocol over an I/O interface that configures attached targets and initiators in a multi-drop bus topology.

SCSI ID. A unique identifier assigned to a SCSI device that is used in protocols on the SCSI interface to identify or select the device. The number of data bits on the SCSI bus determines the number of available SCSI IDs. A wide interface has 16 bits, with 16 possible IDs. A SCSI device is either an initiator or a target.

SDRAM. Static Dynamic Random Access Memory (DRAM with integrated refresh logic)

sequential access. A mode of accessing data on a medium in a manner that requires the storage device to access consecutive storage locations on the medium.

Sequential Stage Group (SSG). The number of tracks that will be prestaged in a sequential operation.

server. A type of host that provides certain services to other hosts that are referred to as clients.

service processor. A dedicated processing unit which is used to service a storage facility.

shared storage. Storage within storage facility that is configured such that multiple similar or different hosts can concurrently access the storage. The storage unit has a uniform appearance to all hosts.

SIM. Service-Information Message.

SIMM. Single In-line Memory Module.

SMIT. System Management Interface Tool.

SNMP. Simple Network Management Protocol.

software transparency. Criteria applied to a processing environment that states that changes do not

require modifications to the host software in order to continue to provide an existing function.

spare. A disk drive that is used to receive data from a device that has experienced a failure that requires disruptive service. A spare can be pre-designated to allow automatic dynamic sparing. Any data on a disk drive that you use as a spare is destroyed by the dynamic sparing copy process.

SRN. Service Request Number or System Reference Number.

SSA. Serial Storage Architecture. An IBM standard for a computer peripheral interface. The interface utilizes a SCSI logical protocol over a serial interface that configures attached targets and initiators in a ring topology.

SSG. Sequential Stage Group

SSID. SubSystem IDentifier.

stacked status. An ESA/390 term for status that the control unit is holding for the channel because the channel responded with the stack-status control the last time the control unit attempted to present the status.

stage. The process of reading data into cache from a disk drive module.

Self-Timed Interface (STI). An interface that has of one or more conductors that transmit information serially between two interconnected units without requiring any clock signals to recover the data. The interface performs clock recovery independently on each serial data stream, and uses information in the data stream to determine character boundaries and inter-conductor synchronization.

STI. Self-Timed Interface.

storage complex. Multiple storage facilities.

storage controller. A physical unit which provides an interface between one or more storage devices and a host computer by providing the function of one or more logical subsystems. The storage controller may provide functions that are not provided by the storage device. The storage controller is composed of one or more clusters.

storage device. A physical unit which provides a mechanism to store data on a given medium such that it can be subsequently retrieved. Also see *disk drive module*.

storage facility. (1) A physical unit which consists of a storage controller integrated with one or more storage devices to provide storage capability to a host computer. (2) A storage server and its attached storage devices.

storage server. A that manages attached storage devices and provides access to the storage or storage related functions for one or more attached hosts.

stripe. The set of tracks in a RAID Rank that have the same parity track. Full stripe writes reduce the RAID 5 write penalty.

striping. A technique that distributes data in bit, byte, multibyte, record, or block increments across multiple disk drives.

subchannel. A logical facilities of a channel subsystem associated with the management of a single device.

subsystem identifier (SSID). A number that uniquely identifies a logical subsystem within a computer installation.

synchronous write. A write operation whose completion is indicated after the data has been stored on a storage device.

T

target. The SCSI term for a storage controller.

TCP. Transmission Control Protocol

track. A unit of storage on a CKD device consisting that can be formatted to contain a number of data records. Also see *home address, track-descriptor record,* and *data record.*

track-descriptor record. A special record on a track following the home address that is used by the control program to maintain certain information about the track. The record has a count field with a key length of zero, a data length of 8, and a record number of 0. This record is sometimes referred to as R0.

transparency. See *software transparency*.

TTY. TeleTYpewriter.

U

Ultra SCSI. An enhanced small computer system interface.

unit address. The ESA/390 term for the address associated with a device on a given control unit. On ESCON interfaces, the unit address is the same as the device address. On OEMI interfaces, the unit address specifies a control unit/device pair on the interface.

utility device. The ESA/390 term for the device used with the Extended Remote Copy facility to access information describing the modifications performed on the primary copy.

V

Versatile Storage Specialist. The web-based management interface to the Versatile Storage Server.

Vital Product Data (VPD). Information that uniquely defines the system, hardware, software, and microcode elements of a processing system.

volume. Refers to a *logical* volume.

VPD. Vital Product Data.

VS Specialist. See Versatile Storage Specialist.

W

write hit. A write operation where the data that you requested is in the cache.

write penalty. The term that describes the classical RAID write operation performance impact.

X

XRC. eXtended Remote Copy.

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IBM Enterprise Storage Server
2105 Model 100 Attachment to ESS Service Guide

Publication No. SY27-7615-00

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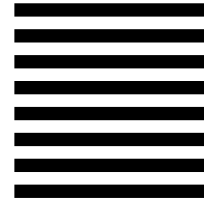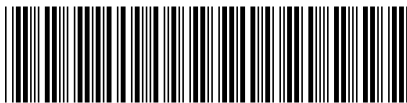
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