7133 Models D40 and T40
Serial Disk Systems

Service Guide

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Contents

Communications Statements

The following statements apply to this product. The statements for other products intended for use with this product appear in their accompanying manuals.

Federal Communications Commission (FCC) Statement

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Neither the provider nor the manufacturer is responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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

Japanese Voluntary Control Council for Interference (VCCI) Statement

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). In a domestic environment, this product might cause radio interference, in which event the user might be required to take adequate measures.

Korean Government Ministry of Communication (MOC) Statement

Please note that this device has been approved for business purposes with regard to electromagnetic interference. If you find that this device is not suitable for your use, you can exchange it for one that is approved for non-business purposes.

New Zealand Compliance Statement

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

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with (IEC) Standard 950.

Avis de conformité à la réglementation d'Industrie Canada

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

Industry Canada Compliance Statement

This Class A digital apparatus complies with IECS-003.

United Kingdom Telecommunications Requirements

This apparatus is manufactured to the International Safety Standard EN60950 and as such is approved in the U.K. under approval number NS/G/1234/J/100003 for indirect connection to public telecommunications systems in the United Kingdom.

European Union (EU) Statement

This product is in conformity with the protection requirements of EU council directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Neither the provider nor the manufacturer can accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards not supplied by the manufacturer.

This product is in conformity with the EU council directive 73/23/EEC (and the Complementary Markings Directive, 93/68/EEC) on the approximation of the laws of the Member States relating to electrical equipment designed for use with certain voltage limits. This conformity is based on compliance with the following harmonized standard: EN60950.

Radio Protection for Germany

Zulassungsbescheinigung laut Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30, August 1995.

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Deutschland.

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

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.

EN55022 Klasse A Geräte bedürfen folgender Hinweise:

Nach dem EMVG: "Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministeriums für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind." (Auszug aus dem EMVG, Para.3, Abs.4). Dieses Genehmigungsverfahren ist nach Paragraph 9 EMVG in Verbindung mit der entsprechenden Kostenverordnung (Amtsblatt 14/93) kostenpflichtig.

Nach der EN 55022: "Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Massnahmen durchzuführen und dafür aufzukommen."

Anmerkung: Um die Einhaltung des EMVG sicherzustellen, sind die Geräte wie in den Handbüchern angegeben zu installieren und zu betreiben.

Taiwan Class A Compliance Statement

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

Safety Notices

For a translation of the *danger* and *caution* notices contained in this book, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual, SA33-3274.

Definitions of Safety Notices

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury.

This book contains a *danger* notice on pages 147 and 167.

A *caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.

This book contains a *caution* notice on pages 210, 213, 215, 216, 219, 222, 223, 227, 229, and 231.

An *attention* notice indicates an action that could cause damage to a program, device, system, or data.

Safety Notice for Installing, Relocating, or Servicing

Before connecting or removing any cables to or from connectors at the using system, be sure to follow the steps in the installation or relocation checklist specified in the *Installation and Service Guide*, or equivalent, for your using system.

For safety checks when servicing, refer to "Service Inspection Guide" on page 64.

Laser Safety Information

Notes:

1. The information given here applies only to 7133s that have the Advanced SSA Optical Extender (Pair) feature.
2. The Advanced SSA Optical Extender, referred to in this information as an optical extender, is part of the serial optic channel converter assembly.

This system contains a laser product called the optical extender. In the United States, the optical extender is certified as a Class 1 laser product that conforms to the requirements contained in the Department of Health and Human Services (DHHS) regulation 21 CFR Subchapter J. Internationally, the optical extender is certified as a Class 1 laser product that conforms to the requirements contained in the International Electrotechnical Commission (IEC) standard 825-1 (1993).

Class 1 laser products are not considered to be hazardous. The optical extender internally contains an indium gallium arsenide / indium phosphide (InGaAs/InP) semiconductor laser diode emitting in the wavelength range of 1280 to 1340 nanometers. This laser diode is a Class 1 laser that is rated at 5.0 milliwatts. The design of the optical extender is such that access to laser radiation above a Class 1 level during operation, user maintenance, or service conditions is prevented.

```
IBM
Part Number nnnnnnn
Class 1 Laser Product
FCC Class A - See Manual
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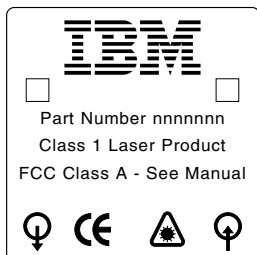
```
CLASS 1 LASER PRODUCT
APPAREIL A LASER DE CLASSE 1
LUOKAN 1 LASERLAITE

TO IEC 825-1:1993
```

About This Book

This book provides service information for service representatives who service 7133 Models D40 and T40 Serial Disk Systems. This information is organized as follows:

- Chapter 1, "Reference Information" briefly introduces the 7133 Models D40 and T40, and gives useful reference information.
- Chapter 2, "Problem Determination Procedures" gives problem determination procedures.
- Chapter 3, "Removal and Replacement Procedures" gives removal and replacement procedures.
- Chapter 4, "Parts Catalog" is the parts catalog.
- Appendix A, "Additional Information for RISC Systems" gives additional information for 7133 Models D40 and T40 that are attached to RISC systems.
- Appendix B, "Additional Information for PC Servers" gives additional information for 7133 Models D40 and T40 that are attached to PC servers.

An index is provided at the back of the book.

Important: *This book does not include service information for 7133 Models 010, 020, 500, and 600 SSA Disk Subsystems.* For those models, see Related Publications in the "Additional Information" appendix (in this book) for your using system.

Numbering Convention

In this book, one gigabyte (GB) equals 1 000 000 000 bytes.

Trademarks

The following items are trademarks of International Business Machines Corporation in the United States, or other countries, or both.

AIX
IBM
RS/6000
Netfinity
@server
pSeries

Related Publications

The *Installation and Service Guide*, or equivalent, for your using system

7133 Models D40 and T40 Serial Disk Systems: Operator Guide, SA33-3278

7133 Model D40 Serial Disk System: Installation Guide, GA33-3279

7133 Model T40 Serial Disk System: Installation Guide, GA33-3280

7133 Models D40 and T40 Serial Disk Systems: Hardware Technical Information, SA33-3281

7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices, SA33-3274.

For other publications, see Related Publications in the "Additional Information" appendix (in this book) for your using system.

For the latest information about SSA, SSA microcode levels, and SSA publications, see the web support page:

http://www.hursley.ibm.com/ssa/

Chapter 1. Reference Information

Are You Using the Correct Book? *Do not use this book if you are servicing a 7133 Model 010, 020, 500, or 600 SSA Disk Subsystem.* For the correct book, see Related Publications in the "Additional Information" appendix (in this book) for your using system.

The 7133 Models D40 and T40 Serial Disk Systems (see Figure 1) are Serial Storage Architecture (SSA) disk subsystems that can be attached to any computer that provides support for SSA. Model D40 **1** is a rack-mounted unit that can be installed in a standard Electrical Industries Association (EIA) 19-inch rack. Model T40 **2** is a deskside unit.
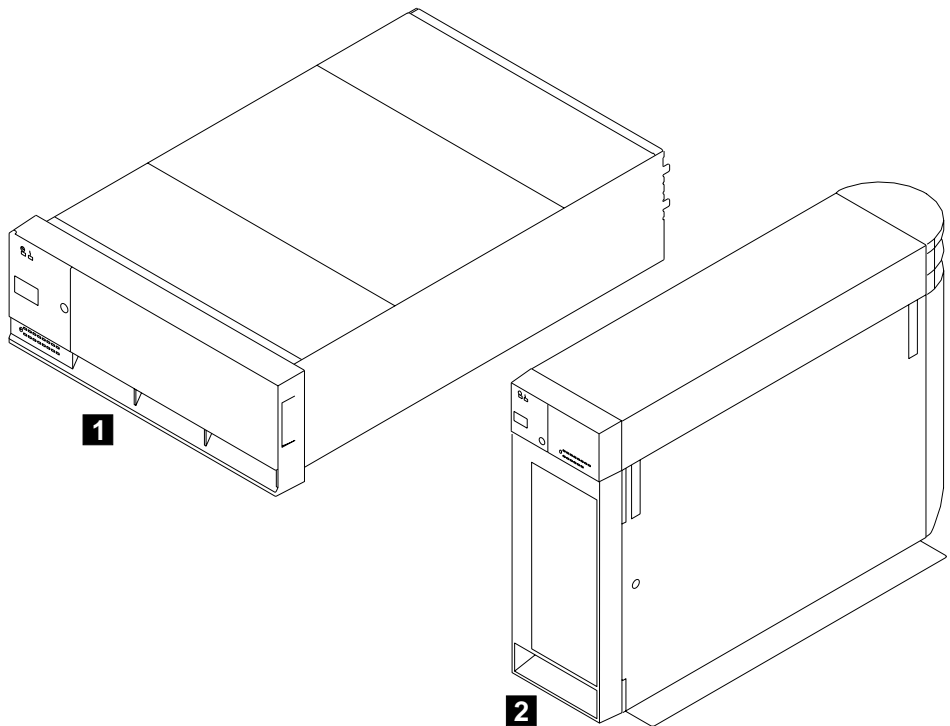
Figure 1. 7133 Models D40 and T40

The 7133 can contain up to 16 SSA disk drive modules (eight at the front and eight at the back). The disk drive modules are connected to each other in strings of four modules (two strings at the front of the 7133, and two strings at the back). These strings can be connected to each other, to strings in other 7133s, or to SSA attachments (for example, SSA adapters). The SSA attachments can be in separate using systems or in the same using system.

The 7133 can be disconnected from its related SSA attachments while the using system is running. Also, most of the field-replaceable units (FRUs) of the 7133 can be removed and replaced while the 7133 and the using system are running. For a list of those FRUs, see "Concurrent Maintenance" on page 137.

Each 7133 Model D40 or Model T40 contains two power supply assemblies and three fan assemblies, which together provide all the necessary power and cooling. It also contains a controller card, which monitors and controls the various functions of the 7133. For further details about the controller card, see "Controller Card" on page 3.

The 7133 Models D40 and T40 can be configured to the using system as devices if applicable. See "Configuring a 7133 to the Using System" in the "Additional Information" appendix (in this book) for your using system. When a 7133 is configured as a device:

- Errors that are detected in the 7133 are logged in the system error log against that 7133.
- Vital product data (VPD) for the 7133 can be accessed.

Each FRU contains its own VPD. A using system can access this VPD while the 7133 is being configured to that particular using system.

Enclosure configuration information is stored in several locations in the 7133 to allow concurrent replacement of FRUs. (Such information might be, for example, the information that is displayed on the ID display of the 7133.) When a new FRU is installed, any special configuration information that is required by that FRU is read from other locations in the 7133. That information is then used to update the new FRU. To ensure that the configuration is not corrupted or changed, always exchange FRUs one at a time. **Do not exchange multiple FRUs between 7133s.**

Controller Card

The controller card of the 7133 Model D40 or Model T40:

- Monitors itself. If it detects a problem, the controller card can generate an SSA error message through the disk drive modules.
- Monitors the ambient air temperature. If the temperature is too high, the controller card can:
  - Increase the speed of the fans.
  - Generate an SSA error message through the disk drive modules.
  - Shut down the 7133, if necessary.
- Monitors the status of the fans. If a problem occurs with the fans, the controller card can:
  - Control the speed of the fans. For example, if one fan fails, the controller card increases the speed of the other two fans to increase the cooling.
  - Generate an SSA error message through the disk drive modules.
  - Shut down the 7133, if necessary.
- Monitors the status of the power supply assemblies. If a power supply assembly fails, the controller card can generate an SSA error message through the disk drive modules.
- Monitors the Remote Power On feature (if installed) through the power supply assembly that is in position 1.
- Monitors and controls the bypass cards.
- Monitors and controls the operator panel.
- Provides support for SCSI Enclosure Services (SES).

SSA Loops and Links

The disk drive modules of the 7133 are connected through two or more SSA links to an SSA attachment that is located in the using system. The disk drive modules, SSA links, and SSA attachment are configured in loops. Each loop provides a data path that starts at one connector of the SSA attachment and passes through a link (external SSA cable) to the disk drive modules. The loop continues through the disk drive modules, then returns through another link to a second connector on the SSA attachment.

At the back of the 7133 are four bypass cards each of which has a pair of SSA connectors for the external cables. Each bypass card provides connections to the backplane assemblies of the 7133. If a bypass card loses both of its external SSA connections, it automatically reconfigures the SSA loop so that the loop remains complete.

For full details about the operation and configuration of bypass cards, see "SSA Bypass Cards" on page 41.

Advanced SSA Optical Extender (Pair) Feature

The Advanced SSA Optical Extender (Pair) feature permits 7133 Models D40 and T40 to be connected to SSA attachments or other devices (for example, other 7133s) through pairs of fibre optic cables. Each end of a pair of fibre optic cables is connected to a Advanced SSA Optical Extender. The Advanced SSA Optical Extender can be plugged into the SSA connector of a device or SSA attachment (for example, an SSA adapter).

The maximum permitted length for a fibre optic cable that connects two SSA nodes (for example, disk drives) is 10 kilometers (32800 feet).

See "Advanced SSA Optical Extenders and Fibre Optic Cables" on page 22 for more details.

Remote Power On Control Feature

The Remote Power On Control feature permits the using system to control the electrical power in 7133 Models D40 and T40. The feature consists of a control unit, a cable that connects the control unit to the 7133, and cables that connect the control unit to the using system. See also "Remote-Power-On Control Unit and Cables" on page 21.

–48 Volt Power Supply (Model D40 Only)

The –48 Volt Power Supply feature provides power supply assemblies that allow the 7133 Model D40 to be connected to –48 volt power sources. The 7133 must be connected to two separate power sources to ensure that operations are not interrupted if one power source fails. The –48 Volt power distribution panel (PDP) in the rack provides the power sources and the power cables. For details about how to connect a 7133 Model D40 to a –48 volt power source, see the *7133 Model D40 Serial Disk System: Installation Guide*.

Attention: Both power supply assemblies in a 7133 must be of the same voltage rating. ***Do not mix power supply assemblies of different voltage ratings.***

Lights and Controls

The lights and controls of the 7133 Models D40 and T40 consist of:
- Operator panel lights and controls
- Disk drive status lights
- Controller card light
- Fan assembly lights
- Power supply assembly lights and controls
- Bypass card lights
- Disk drive module lights

The operator panel of the 7133 is located behind a flap to prevent accidental operation of the controls. To open the flap, press and release the latch button **1** (see Figure 2).
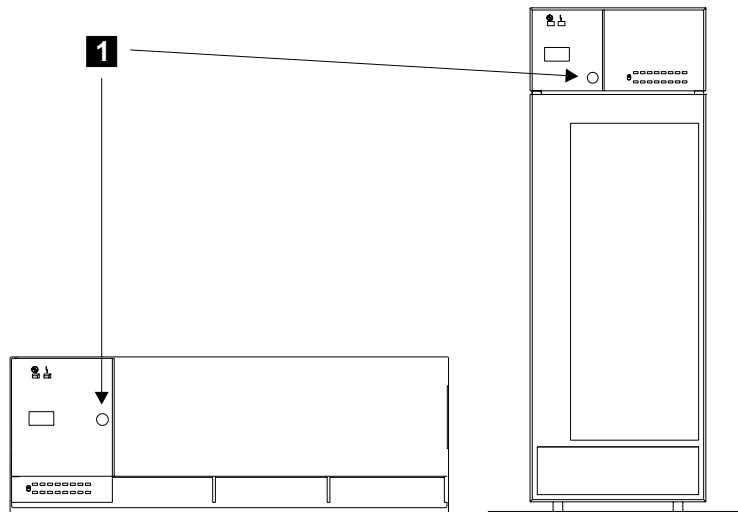
Figure 2. Operator Panel Flap and Latch Button

The flap pivots to the left.

Figure 3 shows the lights and controls of Model D40; Figure 4 shows the lights and controls of Model T40.
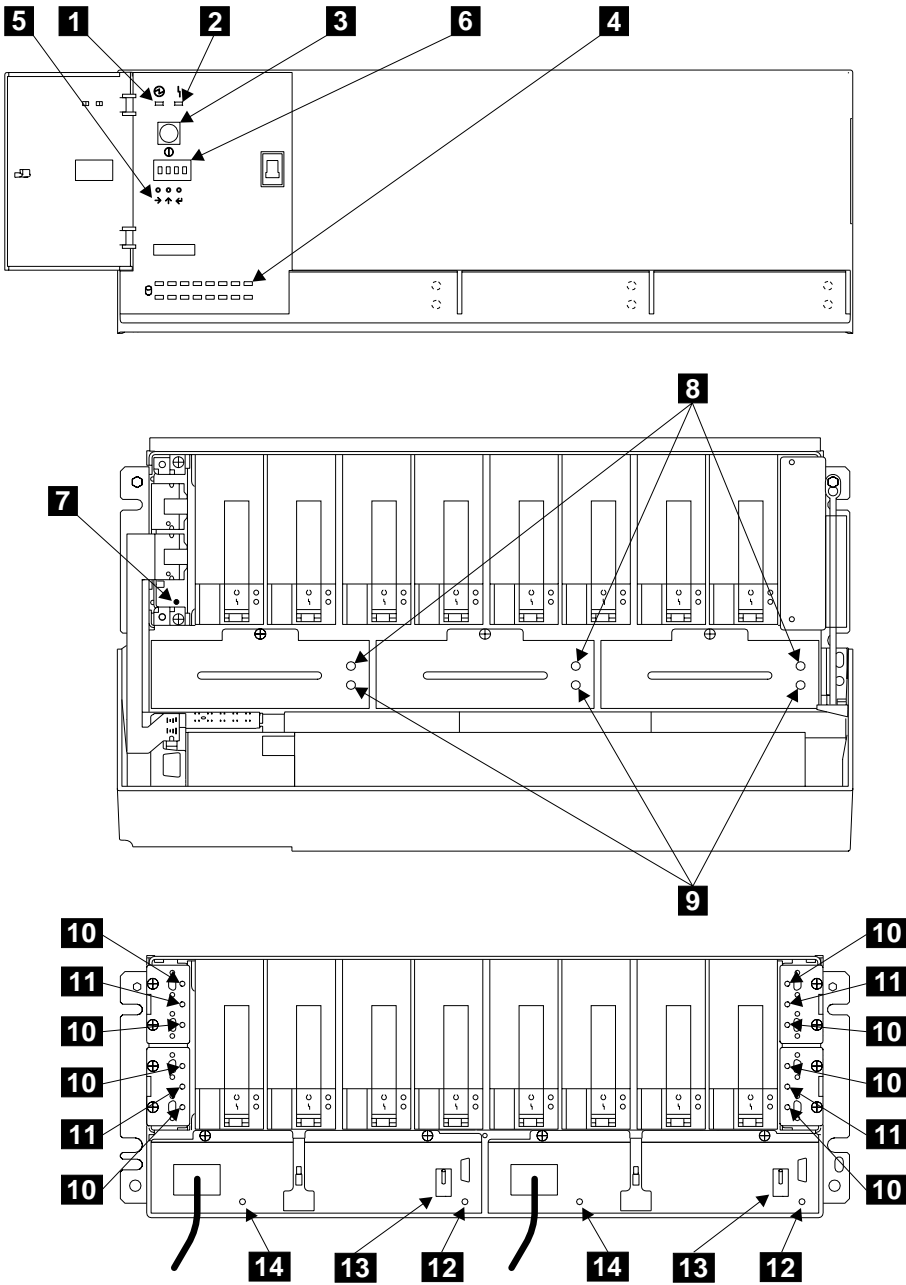
Figure 3. Lights and Controls of Model D40
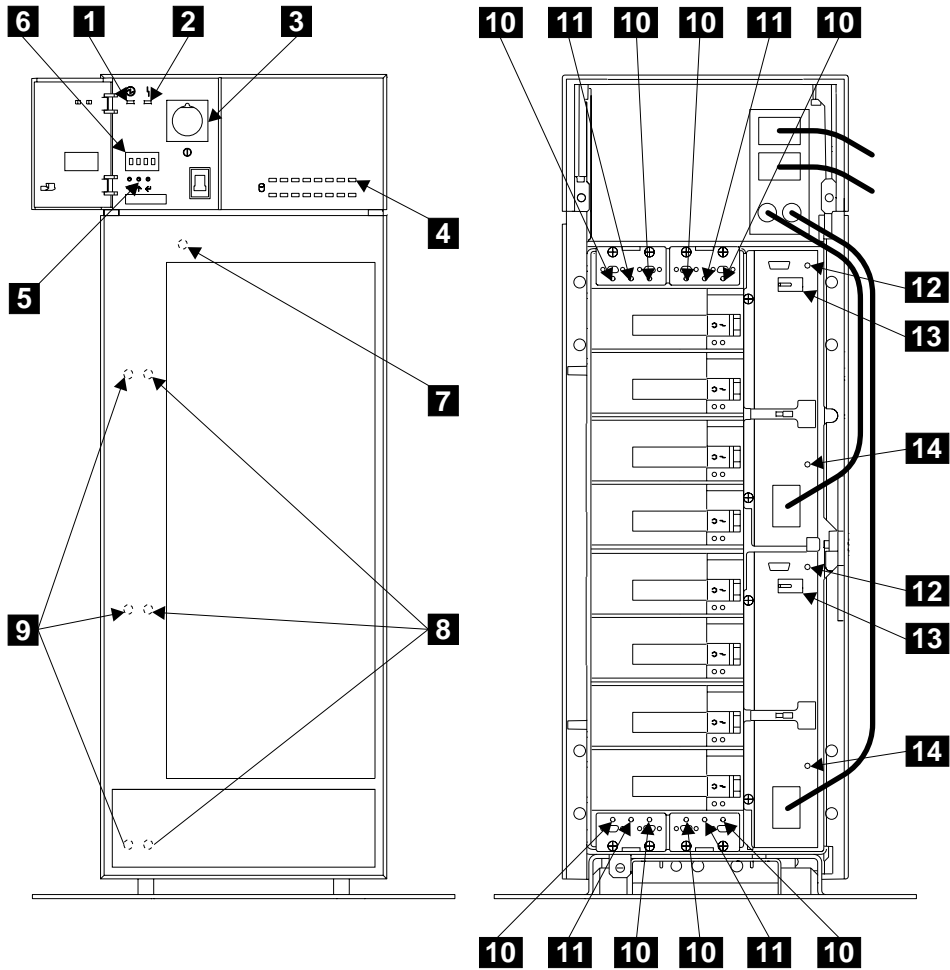
Figure 4. Lights and Controls of Model T40

Operator Panel Lights and Controls

To identify the lights and ID display that are described here, see Figures 3 and 4.

Power switch ❸ **:**

- *On Model D40*, this switch controls the internal dc power that is supplied to the 7133 by its power supply assemblies.

  To switch off the dc power, press and release the Power switch.

  When the dc power is switched off, the 7133 is in Standby mode. If the 7133 remains connected to the mainline-power source while in Standby mode, mainline power is still present in the power supply assemblies.

  To switch on the dc power, press and release the Power switch.

  Note: The action of connecting the 7133 to the power source automatically switches on the dc voltage.

- *On Model T40*, this switch controls the mainline power into the 7133.

  To switch off the mainline power, press and release the Power switch.

  Note: The 7133 Power light and the 7133 Check light might go off, come on, and go off for up to 20 seconds while the power goes down. You can safely remove and replace FRUs during this time.

  When the mainline power is switched off, no mainline power is present in the power supply assemblies.

  To switch on the mainline power, press and release the Power switch.

7133 Power light ❶ **:** This green light is on continuously when the Power switch has been pressed to switch on the 7133, and dc voltage is present in the 7133. The light flashes when the 7133 is in Standby mode.

Note: On Model D40, Standby mode can be set by the 7133 Power switch, or by the Remote Power On feature (if present). On Model T40, Standby mode can be set only by the Remote Power On feature (if present).

7133 Check light ❷ **:** This amber light comes on continuously if a failure occurs in the 7133. The 7133 might be able to continue operating satisfactorily although the failure of a particular part has been detected. The light flashes when a service aid identifies a disk drive module.

ID display ❻ **:** This four-character alphanumeric display shows the location and ID of the 7133. For example, on a rack-mounted 7133 Model D40, you can use two digits to show the ID of the rack, and two digits to show the ID of the 7133, while on a 7133 Model T40, you can use all four digits to show the ID of the 7133. You can set the ID display to represent whatever you require. The resulting ID must, however, be unique.

The display can show characters and symbols from a 40–character font that consists of:
    A through Z
    0 through 9
    ? ! & . blank

You can set the ID display by using:
- The three ID push buttons **5** that are on the operator panel. The ID that you set is used in the location information that is provided to the using system for each device. For a description of the ID push buttons, see "ID push buttons" on page 11.
- The Subsystem Settings service aid.
- Command line tools.

Note: When you change the ID, you might need to reconfigure your 7133 to the using system. See Configuring a 7133 to the Using System in the "Additional Information" appendix (in this book) for your using system.

You can also use the Enclosure Settings service aid and the command line tools to display the location information of the 7133.

See also Location Code Format in the "Additional Information" appendix (in this book) for your using system.

If a failure occurs in the 7133, the display shows an error ID alternating with the ID of the 7133. Table 1 on page 10 shows the error IDs and their related service request numbers (SRNs). If an error ID is displayed, go to Table 1 on page 10, and find the related SRN for that error ID. Then, go to the table in "Service Request Numbers (SRNs)" on page 75, find the SRN, and do the actions for that SRN.

Table 1. Error IDs and Their Related SRNs

Error ID	See SRN
BP1 BP16	80241 80242
BP4 BP5	80243 80244
BP8 BP9	80245 80246
BP12 BP13	80247 80248
CODE	80210
COLD	80253
COOL	80254
CTRL	80210
FAN1	80231
FAN2	80232
FAN3	80233
HOT	80251
OPNL	80211
POST-FAIL-XXXX Where XXXX= XROM WDOG IROM IRAM LED! I2C RTC1 RTC2 TIME UART FAN XRAM	80210
PSU1	80221
PSU2	80222
SLOT	80260
WARM	80252

Note: If the COLD or HOT error ID remains for four minutes, the internal dc power switches off (that is, the 7133 enters Standby mode).

If the error ID is COLD, the internal dc power switches on automatically after the temperature has increased and has remained more than 5°C above the critical temperature for 15 minutes.

If the error ID is WARM, the error is not reset until the ambient temperature has fallen at least 2°C below the warning level.

If the error ID is HOT, the internal dc power switches on automatically after the temperature has decreased and has remained more than 5°C below the critical temperature for 15 minutes.

ID push buttons $\blacksquare$ **:** These three push buttons set the Subsystem ID that is shown on the ID display $\boxed{6}$. You need a ball-point pen or similar instrument to press these push buttons.

- Press the left button to step one position through the four character positions of the alphanumeric display. Press the button the appropriate number of times to select the character position that you want to change.
- Press the center button to step one character through the font of alphanumeric characters. Press the button the appropriate number of times to select the character that you want to enter.
- Press the right button to store the selected ID.

If you do not press any button in 10 seconds, the display resets to its last known valid entries.

Note: When you change the ID, you might need to reconfigure your 7133 to the using system. See the "Additional Information" appendix (in this book) for your using system.Configuring a 7133 to the Using System

If you hold all three buttons pressed until the display flashes (approximately 10 seconds), all bypass cards that are not jumpered for Forced Inline mode are reset to Automatic mode (the default mode).

Disk Drive Status Lights

To identify the lights that are described here, see Figures 3 and 4.

These 16 green status lights **4** are related to the disk drive modules that are contained in the 7133. The upper row of eight lights represents, from left to right, the front disk drive modules, 1 through 8. The lower row represents, from right to left, the back disk drive modules, 9 through 16.

Each status light shows the following conditions:

Status of Light	Meaning
Off	Both SSA links are inactive because one of the following conditions exists:
	• The disk drive modules, dummy disk drive modules, or module and SSA attachment that are logically next to this module are not connected or are missing.
	• A dummy disk drive module is present in this position.
	• The disk drive modules or module and SSA attachment that are logically next to this module are inactive.
	• An SSA attachment that is in the loop is inactive.
	• A power-on self-test (POST) is running on this disk drive module.
Permanently on	Both SSA links are active, and the disk drive module is ready to accept commands from the using system. The Ready light does not show that the motor of the disk drive module is running. The module might be waiting for a Motor Start command, or might have received a Motor Stop Command.
Slow flash (two seconds on, two seconds off)	Only one SSA link is active.
Fast flash (five times per second)	The disk drive module is active with a command in progress.

Controller Card Light

To identify the light that is described here, see Figures 3 and 4.

Controller Card Check light **7** **:** This light comes on if the controller card fails. It can be seen only when the front cover is open.

Fan Assembly Lights

To identify the lights that are described here, see Figures 3 and 4.

Fan Power light **8** **:** This green light is on when dc voltage is present at the fan.

Fan Check light **9** **:** This amber light comes on and stays on if the fan fails.

The fan assembly lights can be seen only when the front cover is open.

Power Supply Assembly Lights and Controls

To identify the lights and controls that are described here, see Figures 3 and 4.

PWR/FAULT RESET switch **13** **:** This switch switches off the dc output voltage from the power supply assembly. To switch off the dc voltage, push the switch downward (Model D40) or rightward (Model T40). To switch on the dc voltage, push the switch upward (Model D40) or leftward (Model T40).

Note: On early power supply assemblies, pull the switch outward, then push it in the appropriate direction.

If the 7133 has a serious power problem, the power supply assembly can become latched off. By switching the PWR/FAULT RESET switch off, then on, you can reset the power supply assembly.

PWR light **14** **:** This green light is on when mainline electrical power is present in the power supply assembly.

CHK/PWR-GOOD light **12** **:** This light shows amber if the dc output from the power supply assembly fails. On 7133s that have the Remote Power On Control feature, the light goes off when power is switched off at the using system or at the remote-power-on control unit.

The light shows green when the dc output from the power supply assembly is active.

Bypass Card Lights

To identify the lights that are described here, see Figures 3 and 4.

Link Status (Ready) light **10** **:** This green light shows the status of the port (for example, port 1) through which the bypass card is connected to another device:

Status of Light	Meaning
Off	One of the following:
	• The path through this port is not operational.
	• The card is switched into Bypass state (mode light shows amber).
	• The card is jumpered for Forced Inline mode (mode light shows green).
Permanently on	The path through this port is operational.
Flashing	The path through this port is not operational.

Mode light **11** **:** This light has two colors that show in which mode the bypass card is operating.

Status of Light	Meaning
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 state.

Table 2 summarizes the states of the three bypass card lights.

Table 2. Summary of Bypass Card Lights

Operating Mode	Status	Link Status Light	Mode Light	Link Status Light
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

Disk Drive Module Lights
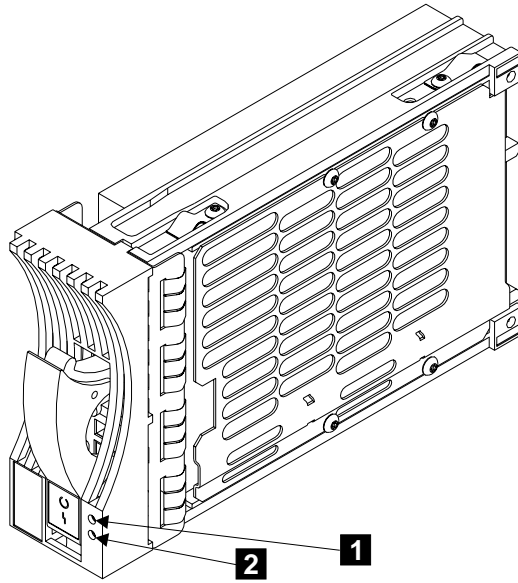
Figure 5. Disk Drive Module Lights

1 **Ready light:** This green light shows the following conditions:

Status of Light	Meaning
Off	Both SSA links are inactive because one of the following conditions exists:
	• The disk drive modules, dummy disk drive modules, or module and SSA attachment that are logically next to this module are not connected or are missing.
	• The disk drive modules or module and SSA attachment that are logically next to this module are inactive.
	• An SSA attachment that is in the loop is inactive.
	• A power-on self-test (POST) is running on this disk drive module.
Permanently on	Both SSA links are active, and the disk drive module is ready to accept commands from the using system. The Ready light does not show that the motor of the disk drive module is running. The module might be waiting for a Motor Start command, or might have received a Motor Stop Command.
Slow flash (two seconds on, two seconds off)	Only one SSA link is active.
Fast flash (five times per second)	The disk drive module is active with a command in progress.

The status of this Ready light is also shown in the disk drive status lights at the front of the 7133.

2 **Check light:** This amber light shows the following conditions:

Status of Light	Meaning
Off	Normal operating condition.
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 light comes on as soon as the disk drive module is switched on, and goes off when the POSTs are complete. If the light remains on for longer than one minute after the disk drive module is switched on, the POSTs have failed.

- Neither SSA link is active.

- The disk drive module is in Service mode, and can be removed from the 7133.

Flashing	The Check light has been set by a service aid to identify the position of this particular disk drive module.

Other 7133 Settings

The 7133 Models D40 and T40 have other settings that you can change by way of the service functions:

- Enclosure ID. (You can also use the ID push buttons to change the ID; see "ID push buttons" on page 11.)
- Bypass card modes.
- Temperature warnings (low and high).
- Exchanged / swap flags.

For more details, see "Service Functions" on page 62.

Parts Locations

This section has two subsections; one is for Model D40, the other is for Model T40. Go to the appropriate subsection.

Parts Locations (Model D40)

This subsection shows the locations of various parts of the 7133 Model D40.

1	Front cover	**8**	Power supply assembly (position 2)
2	Operator panel assembly	**9**	Power supply assembly (position 1)
3	Disk drive status lights assembly	**10**	Bypass card 1 (ports 4 and 5)
4	Controller card assembly	**11**	Bypass card 2 (ports 8 and 9)
5	Disk drive modules	**12**	Fan assembly (position 3)
6	Bypass card 3 (ports 1 and 16)	**13**	Fan assembly (position 2)
7	Bypass card 4 (ports 12 and 13)	**14**	Fan assembly (position 1)
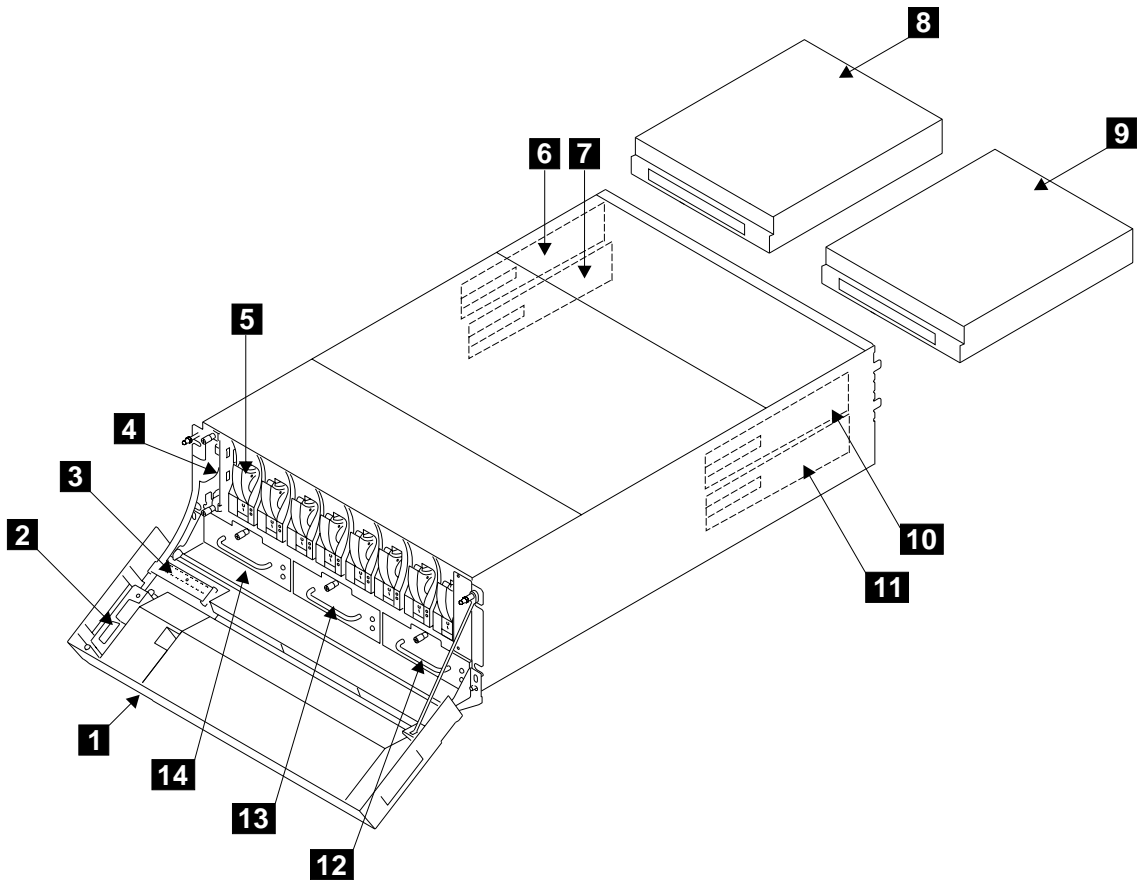
Figure 6. Parts Locations of Model D40

Note: The front disk drive modules are numbered 1 through 8 from left to right (viewed from the front of the 7133). The back disk drive modules are numbered 9 through 16 from left to right (viewed from the back of the 7133).

Parts Locations (Model T40)

This subsection shows the locations of various parts of the 7133 Model T40.

1	Front cover	**9**	Power supply assembly (position 1)
2	Operator panel assembly	**10**	Back cover
3	Disk drive status lights assembly	**11**	Bypass card 1 (ports 4 and 5)
4	Controller card assembly	**12**	Bypass card 2 (ports 8 and 9)
5	Power switch and cable assembly	**13**	Disk drive modules
6	Bypass card 4 (ports 12 and 13)	**14**	Fan assembly (position 3)
7	Bypass card 3 (ports 1 and 16)	**15**	Fan assembly (position 2)
8	Power supply assembly (position 2)	**16**	Fan assembly (position 1)
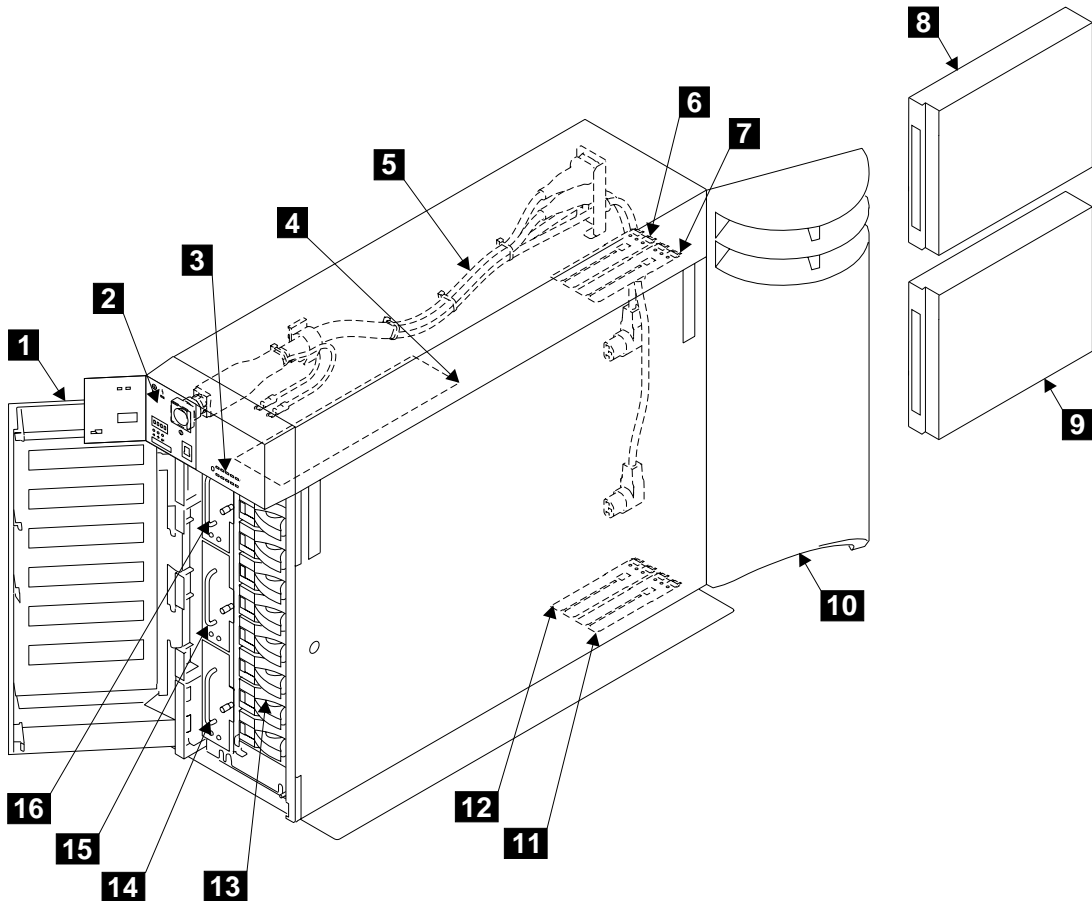
Figure 7. Parts Locations of Model T40

Note: The front disk drive modules are numbered 1 through 8 from top to bottom. The back disk drive modules are numbered 9 through 16 from bottom to top.

Remote-Power-On Control Unit and Cables

▌1▐ Remote-power-on control unit
▌2▐ 7133 power-control cable
▌3▐ Using-system power-control cables
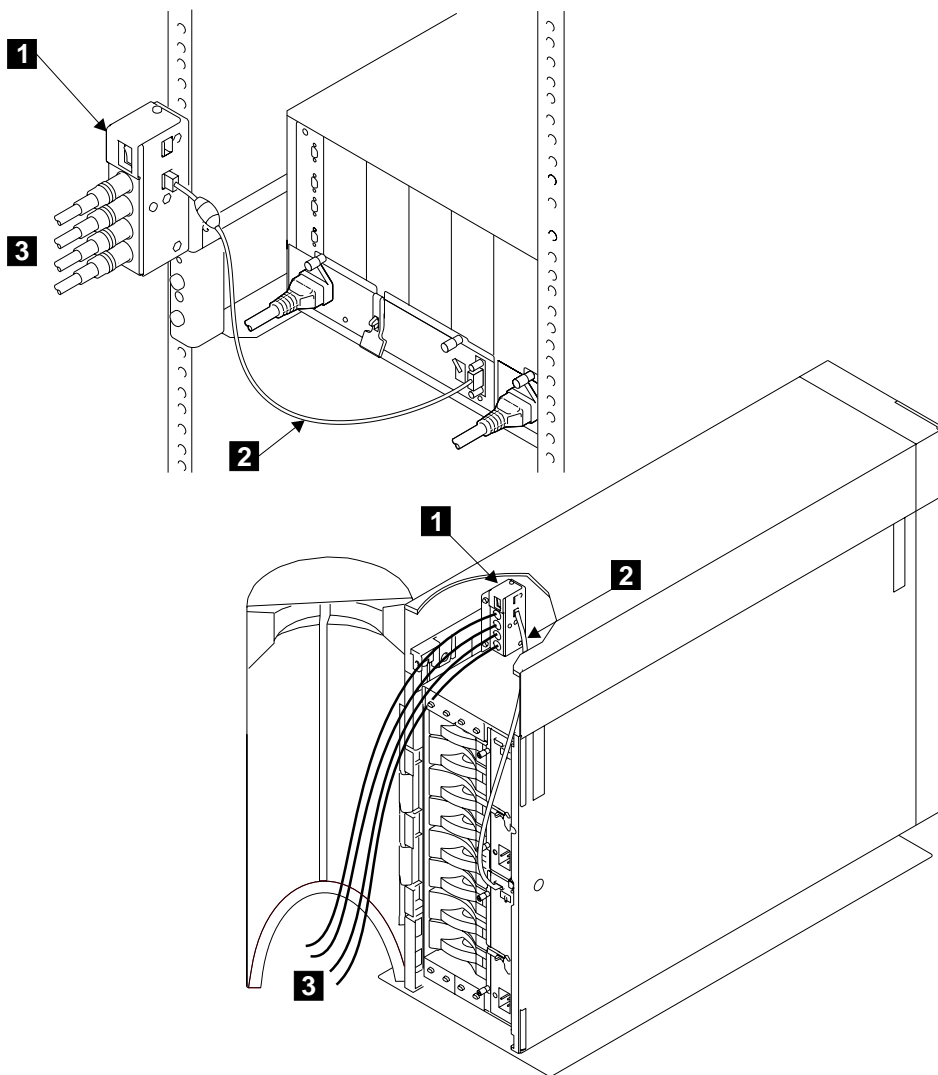
Figure 8. Remote-Power-On Control Unit and Cables

Advanced SSA Optical Extenders and Fibre Optic Cables

The Advanced SSA Optical Extender (Pair) feature can be configured for single-mode operations or for multi-mode operations. The two configurations are show here.

Single-Mode Configuration

1	Advanced SSA Optical Extender (Pair)	**6**	Fibre optic cable
2	Power light	**7**	Wrap cable and adapter assembly
3	Receive light	**8**	Fibre optic wrap cable
4	Receive symbol	**9**	Fibre optic wrap adapter
5	Transmit symbol		
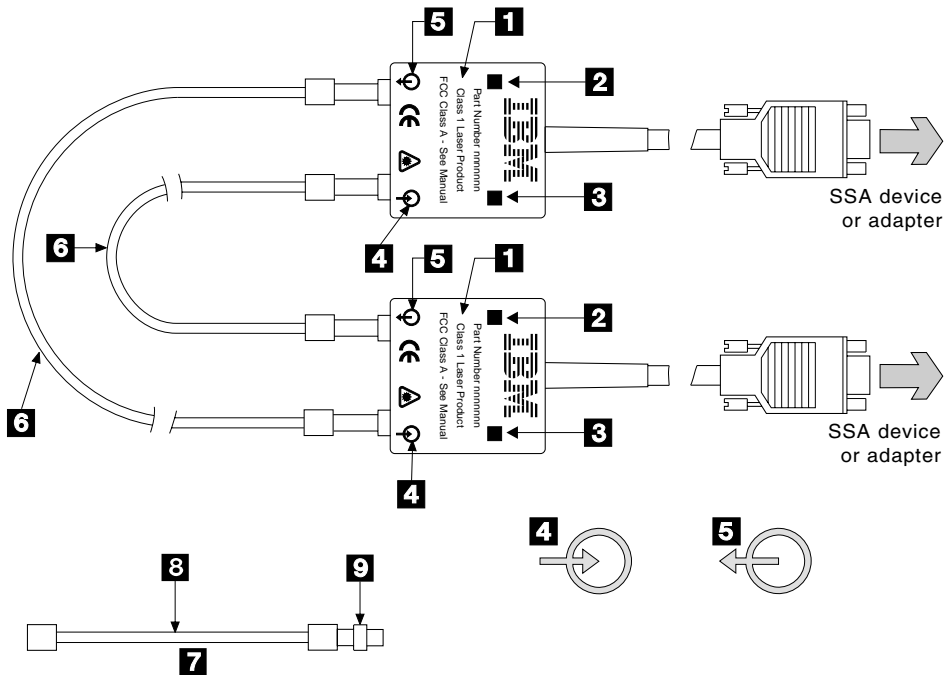
Figure 9. Advanced SSA Optical Extenders and Fibre Optic Cables in Single-Mode Configuration

For single-mode configurations, each fibre optic cable must be connected between the Receive connector (note the symbol **4**) of one Advanced SSA Optical Extender and the Transmit connector (note the symbol **5**) of the other Advanced SSA Optical Extender.

At the Receive connector, the Advanced SSA Optical Extender receives data *from* a using system or device via the fibre optic cable. At the Transmit connector, the Advanced SSA Optical Extender sends data *to* a using system or device via the fibre optic cable.

Note: In the remainder of this book, the term "optical extender" is generally used for the Advanced SSA Optical Extender.

A wrap cable and adapter assembly **7** is provided with each optical extender. This assembly consists of a fibre optic wrap cable **8** and a fibre optic wrap adapter **9** . The two parts of the assembly are used during diagnostic procedures. The wrap cable connects the connectors of the optical extender to each other; the fibre optic wrap adapter connects the two fibre optic cables to each other.

Attention:

- Before fibre optic cables are connected, they must be checked to ensure that their end faces are clean. If necessary, use a small cotton pad to apply a fibre-cleaning fluid, such as IPA/D-1 Water Mix 106-17F, to the end faces.
- When the wrap cable and adapter assembly is not in use, the ends of the wrap cable are protected as follows:
    - If the wrap cable is 400 mm (15 in.) long, each of its ends is connected to the wrap adapter to make a closed loop.
    - If the wrap cable is 150 mm (6 in.) long, one end of the cable is connected to the wrap adapter, and protective covers are placed over each end of the complete wrap cable and adapter assembly.

    The wrap cable and adapter assembly must be kept in its plastic bag in a safe place that is as close to the optical extender as possible. At least one wrap cable and adapter assembly must be kept at each end of the link.

All the connectors for the fibre optic cables are bayonet (push-and-twist) connectors. The installation and repair of fibre optic cables must be done by a fibre optics specialist.

Multi-Mode Configuration

1	Advanced SSA Optical Extender (Pair)	**8**	Advanced Multi-Mode Conditioner (Pair)
2	Receive light	**9**	Uniter
3	Receive symbol	**10**	Multi-mode fibre optic cable
4	Transmit symbol	**11**	Wrap cable and adapter assembly
5	Power light	**12**	Fibre optic wrap cable
6	Yellow fibre	**13**	Fibre optic wrap adapter
7	Orange fibre		
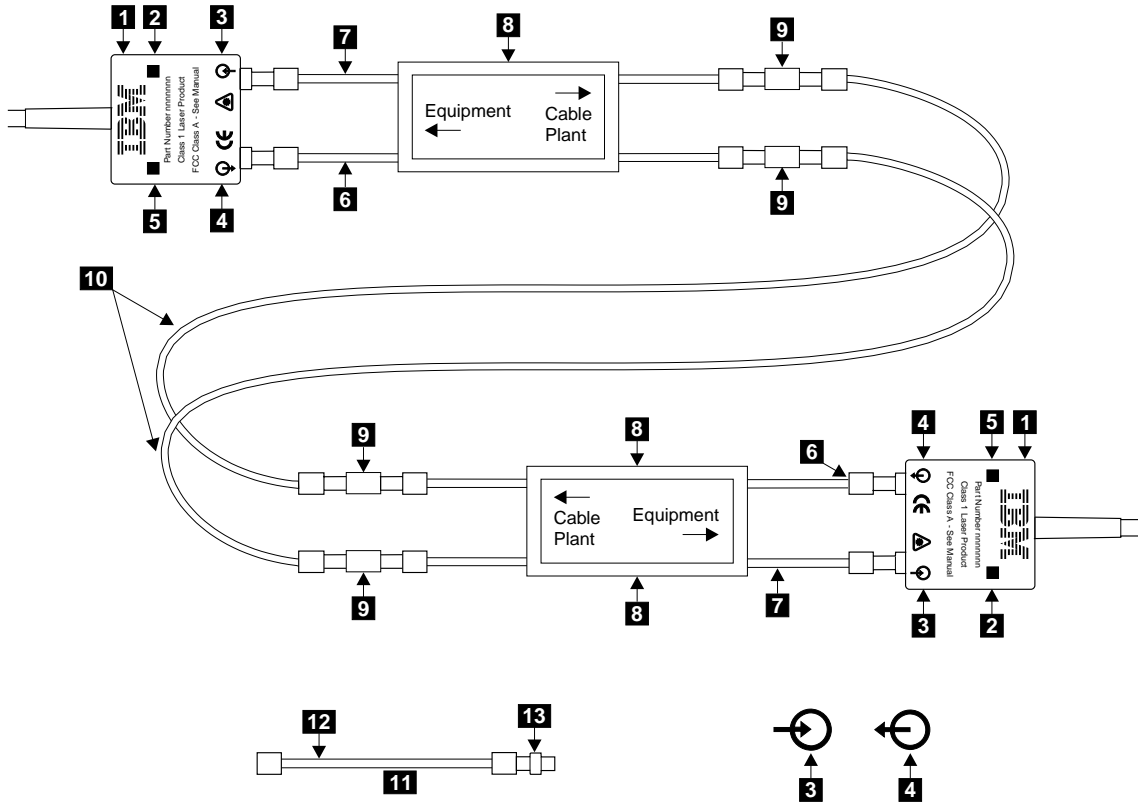
Figure 10. Advanced SSA Optical Extenders and Fibre Optic Cables in Multi-Mode Configuration

For multi-mode configurations, an Advanced Multi-Mode Conditioner must be present between each Advanced SSA Optical Extender and the fibre optic cables. The yellow fibre **6** of the Advanced Multi-Mode Conditioner (labeled "Equipment ") is connected to the Transmit connector (note the symbol **4**) of the Advanced SSA Optical Extender. The orange fibre **7** of the Advanced Multi-Mode Conditioner is connected to the Receive connector (note the symbol **3**) of the Advanced SSA Optical Extender. The fibre optic cables are connected via uniters **9** to the two connectors (labeled "Cable Plant") at the other end of the Advanced Multi-Mode Conditioner. Each fibre optic cable

must be connected, via the two Advanced Multi-Mode Conditioners, between the Receive connector of one Advanced SSA Optical Extender and the Transmit connector of the other Advanced SSA Optical Extender.

At the Receive connector, the Advanced SSA Optical Extender receives data *from* a using system or device via the fibre optic cable and the Advanced Multi-Mode Conditioner. At the Transmit connector, the Advanced SSA Optical Extender sends data *to* a using system or device via the Advanced Multi-Mode Conditioner and the fibre optic cable.

Note: In the remainder of this book, the term "optical extender" is generally used for the Advanced SSA Optical Extender, and the term "multi-mode conditioner" is generally used for the Advanced Multi-Mode Conditioner.

A wrap cable and adapter assembly **11** is provided with each optical extender. This assembly consists of a fibre optic wrap cable **12** and a fibre optic wrap adapter **13**. The two parts of the assembly are used during diagnostic procedures. The wrap cable connects the connectors of the optical extender to each other; the fibre optic wrap adapter connects the two fibre optic cables to each other.

Attention:
- Before fibre optic cables are connected, they must be checked to ensure that their end faces are clean. If necessary, use a small cotton pad to apply a fibre-cleaning fluid, such as IPA/D-1 Water Mix 106-17F, to the end faces.
- When the wrap cable and adapter assembly is not in use, the ends of the wrap cable are protected as follows:
  - If the wrap cable is 400 mm (15 in.) long, each of its ends is connected to the wrap adapter to make a closed loop.
  - If the wrap cable is 150 mm (6 in.) long, one end of the cable is connected to the wrap adapter, and protective covers are placed over each end of the complete wrap cable and adapter assembly.

  The wrap cable and adapter assembly must be kept in its plastic bag in a safe place that is as close to the optical extender as possible. At least one wrap cable and adapter assembly must be kept at each end of the link.
- For multi-mode operations, the correct type of multi-mode conditioner must be installed (see "Specifications for Fibre Optic Cables and Connectors" on page 26).

All the connectors for the fibre optic cables are bayonet (push-and-twist) connectors. The installation and repair of fibre optic cables must be done by a fibre optics specialist.

Specifications for Fibre Optic Cables and Connectors

The Advanced SSA Optical Extenders can drive single-mode operations and multi-mode operations. Fibre optic cables and connectors must be to the following specifications:

Fibre optic cables for single-mode operations	9/125 microns
Fibre optic cables for multi-mode operations	50/125 microns or 62.5/125 microns **Note:** Each type of cable needs a particular type of multi-mode conditioner (see the Parts Catalog in Chapter 4, "Parts Catalog").
Connector type	ST2 (preferred for all new installations) or ST
Uniter type (multi-mode only)	ST2
Maximum permitted length between two SSA nodes (for example, disk drives)	3 kilometers (9842 feet) for multi-mode operations, but see also Note. 10 kilometers (32800 feet) for single-mode operations, but see also Note. **Note:** Lengths of 3 kilometers and 10 kilometers are permitted only if the fibre optic connection is between:

- Two 7133s Model D40 or T40
- A 7133 Model D40 and a 7133 Model T40
- A 7133 Model D40 or T40 and an Advanced SerialRAID Adapter
- A 7133 Model D40 or T40 and an Advanced SerialRAID/X Adapter
- Two Advanced SerialRAID Adapters
- Two Advanced SerialRAID/X Adapters

Otherwise, the maximum permitted length for single-mode and multi-mode operations is 2.4 kilometers (7874 feet).

Optical Extender Lights

Power light: This light is on when the +5-volt input is present.

Receive light: This light shows that light is being received at the input connector of the optical extender. The received light might not be a valid SSA signal.

Connectors

This section shows the locations of the external connectors of the 7133 Models D40 and T40.

Back Connectors (Model D40)

1 SSA connectors

2 Reserved

3 Mainline power connectors

4 Power control connector
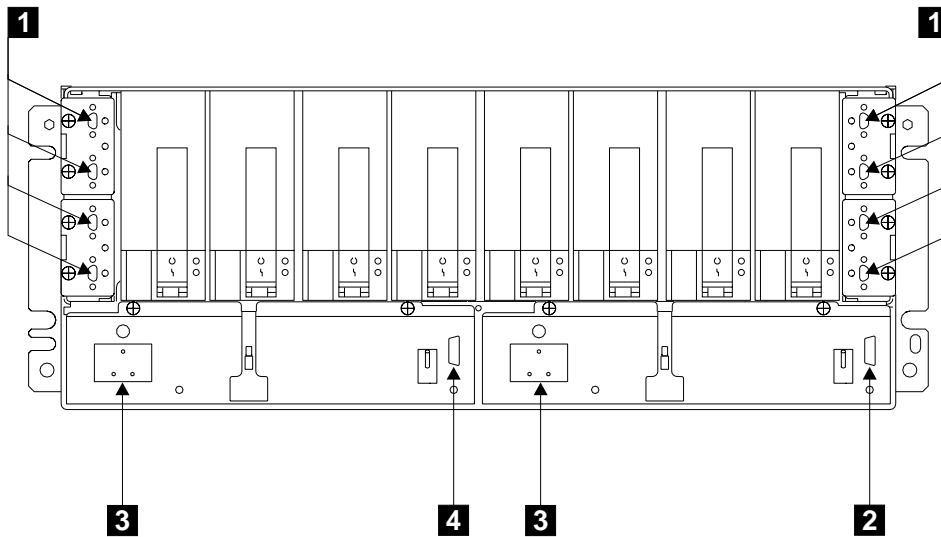
Figure 11. Back Connectors of Model D40

Table 3. Relationship between Strings and Connectors of Model D40

Connectors	Disk Drive Modules
1 and 4	Front disk drive modules 1 through 4
5 and 8	Front disk drive modules 5 through 8
9 and 12	Back disk drive modules 9 through 12
13 and 16	Back disk drive modules 13 through 16

Internal Connections (Model D40)

Inside the 7133, the disk drive modules are connected in strings of four modules. These strings are connected to the external SSA connectors at the back of the 7133.

Figure 12 shows the relationships between the disk drive module strings and the external SSA connectors at the back of the 7133 Model D40.

Table 3 on page 27 summarizes the relationship between the disk drive module strings and the external SSA connectors.
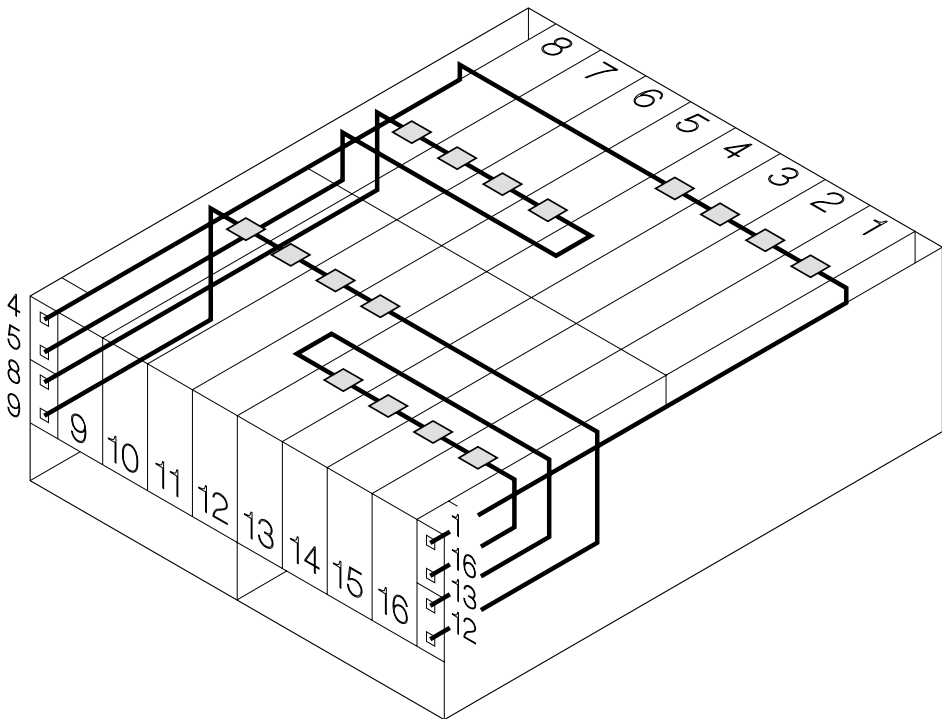
Figure 12. Internal Connections of Model D40

Back Connectors (Model T40)

1 Mainline power connectors
2 Reserved
3 Power control connector
4 SSA connectors
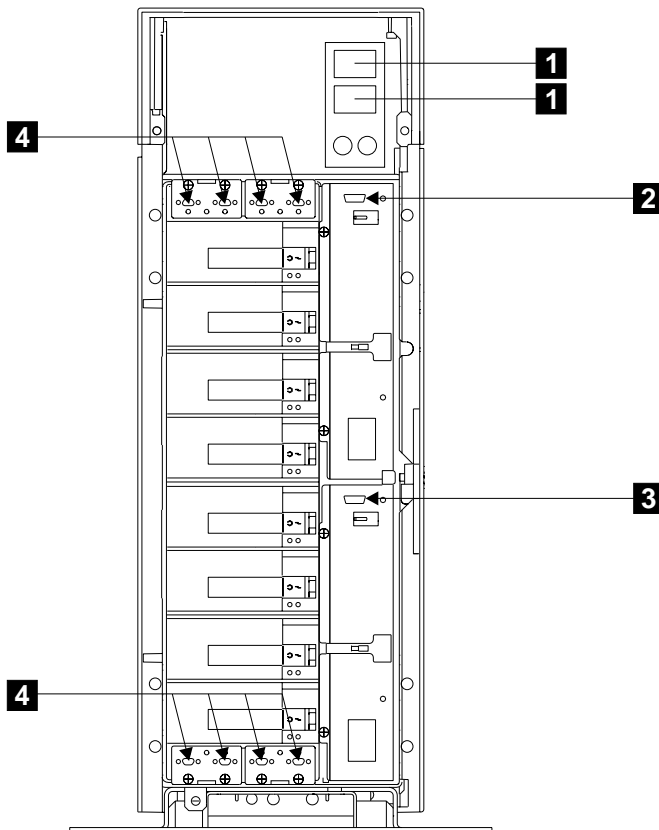
Figure 13. Back Connectors of Model T40

Table 4. Relationship between Strings and Connectors of Model T40

Connectors	Disk Drive Modules
1 and 4	Front disk drive modules 1 through 4
5 and 8	Front disk drive modules 5 through 8
9 and 12	Back disk drive modules 9 through 12
13 and 16	Back disk drive modules 13 through 16

Internal Connections (Model T40)

Inside the 7133, the disk drive modules are connected in strings of four modules. These strings are connected to the external SSA connectors at the back of the 7133.

Figure 14 show the relationships between the disk drive module strings and the external SSA connectors at the back of the 7133 Model T40.

Table 4 on page 29 summarizes the relationship between the disk drive module strings and the external SSA connectors.
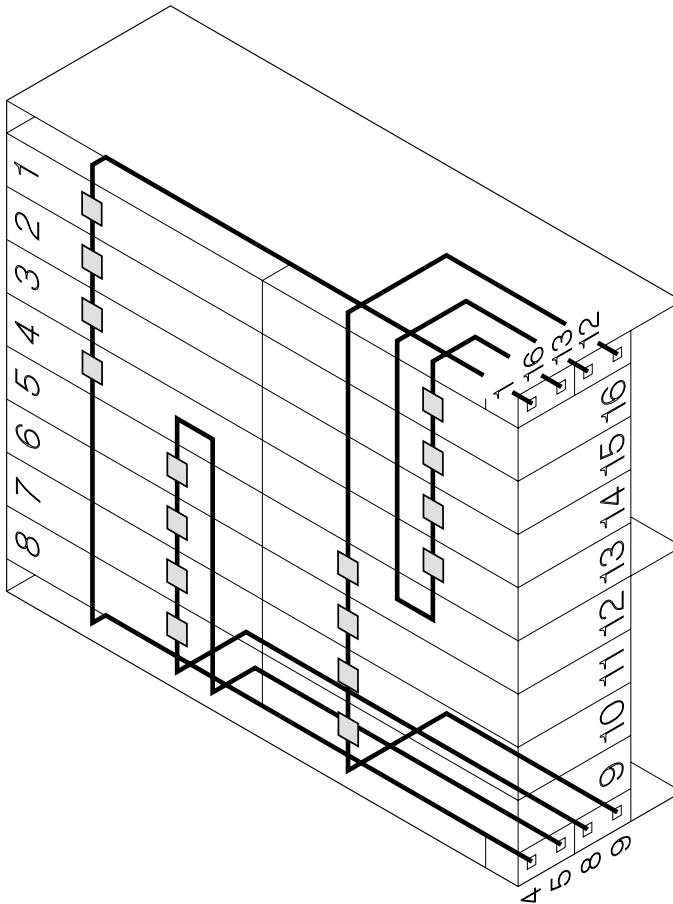
Figure 14. Internal Connections of Model T40

SSA Connectors

The SSA connectors are 9-pin high-density, shielded ITT-Canon Micro MDSM connectors.
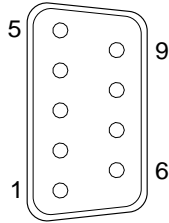
Figure 15. SSA Connectors

The pin assignments are:

Pin	Assignment	Pin	Assignment
1	Cable type	6	Line Out +
2	Line Out −	7	Advanced SSA Optical Extender
3	Ground	8	+5 V
4	Line In −	9	Line In +
5	Ground		

Because SSA systems are always cabled in loops, no terminators are required.

Notes:

1. If pin 1 is at ground, it indicates that a 40 MB/s cable is attached.
2. If pin 7 is at ground, it indicates that an Advanced SSA Optical Extender is connected.

Mainline-Power Connector (Model D40, 220 V ac/dc)

This type of connector is on each power supply assembly. It permits the 7133 to be connected to the mainline power source inside the rack.
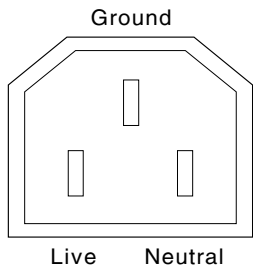
Figure 16. Mainline-Power Connector (220 V ac/dc, Model D40)

Attention: *Never use power cables from a 7133 Model 010, 020, 500, or 600 to connect a 7133 Model D40 to the mainline power outlet. Use only the shielded power cables that are supplied with the 7133 Model D40.*

Mainline-Power Connector (Model D40, –48 V dc)

This type of connector is on each –48 V power supply assembly.
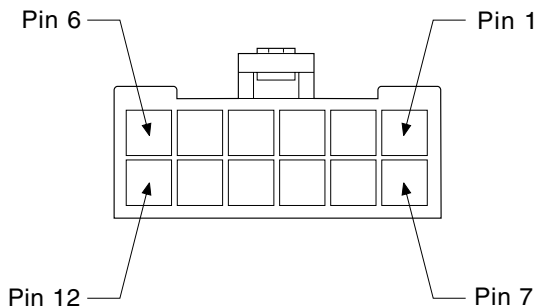
Figure 17. Mainline-Power Connector (–48 V dc)

Pin	Assignment	Pin	Assignment
1	Frame ground	7	Frame ground
2	Not used	8	Not used
3	–48 V return (0 V)	9	–48 V return (0V)
4	–48 V return (0 V)	10	–48 V return (0V)
5	–48 V in	11	–48 V in
6	–48 V in	12	–48 V in

Mainline-Power Connector (Model T40)

This type is of connector is used in the power switch and cable assembly. It permits the 7133 to be connected to a mainline power source.
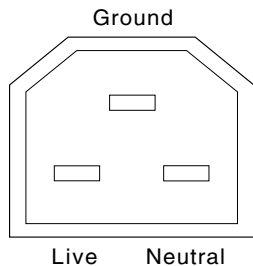
Figure 18. Mainline-Power Connector (220 V ac, Model T40)

Internal Power Connector (Model T40)

This type of connector is on each power supply assembly.
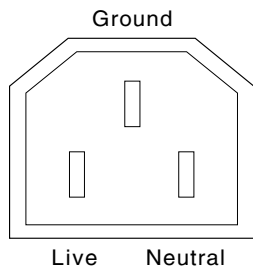
Figure 19. Internal Power Connector (220V ac, Model T40)

Remote-Power-On Control Unit Connectors and Switch

1	7133 power control connector
2	7133 power control connector
3	Using-system main (MAIN) power-control connectors
4	Using-system auxiliary (AUX) power-control connectors
5	Remote-Power-On Control Unit On/Off switch
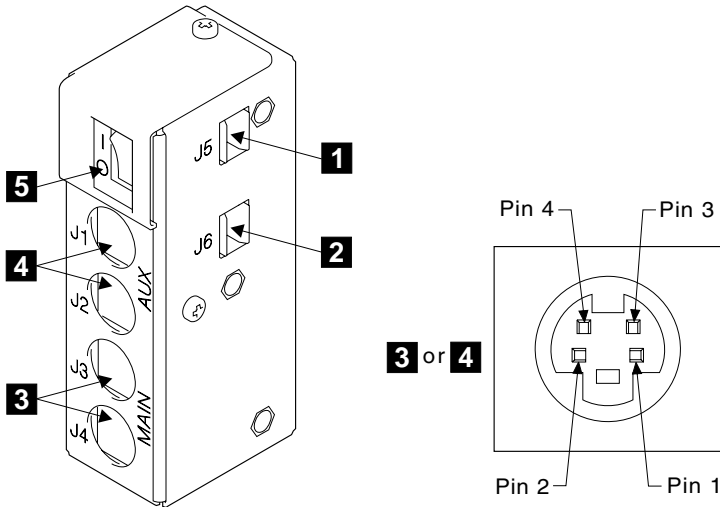
Figure 20. Remote-Power-On Control Unit Connectors and Switch

Main (MAIN) Connector Pin Assignments

Pin	Assignment
1	Main power control +
2	Main power control –
3	Link
4	Ground

Auxiliary (AUX) Connector Pin Assignments

Pin	Assignment
1	Auxiliary power control +
2	Auxiliary power control –
3	No connection
4	No connection

Power Distribution Schematic

Power Light

Operator Panel

Controller Card

Disk
Drive
Module

Front Backplane

Power Backbus

5V

12V

Back Backplane

Disk
Drive
Module

Power Light

Fan Assembly 1

Power Light

Fan Assembly 2

Power Light

Fan Assembly 3

12V

5V

Power Supply Assembly 1

Power Supply Assembly 2

Power Light

Power Light

Mainline Power Switch
(Model T40 Only)

Power Control

Mainline Power Source

Figure 21. Power Distribution

Labels

1	Serial number (7133 Model D40)	**4**	Serial number (disk drive module)
2	Serial number (7133 Model T40)	**5**	Last 8 digits of the SSA UID
3	SSA 16-digit unique ID (UID)		
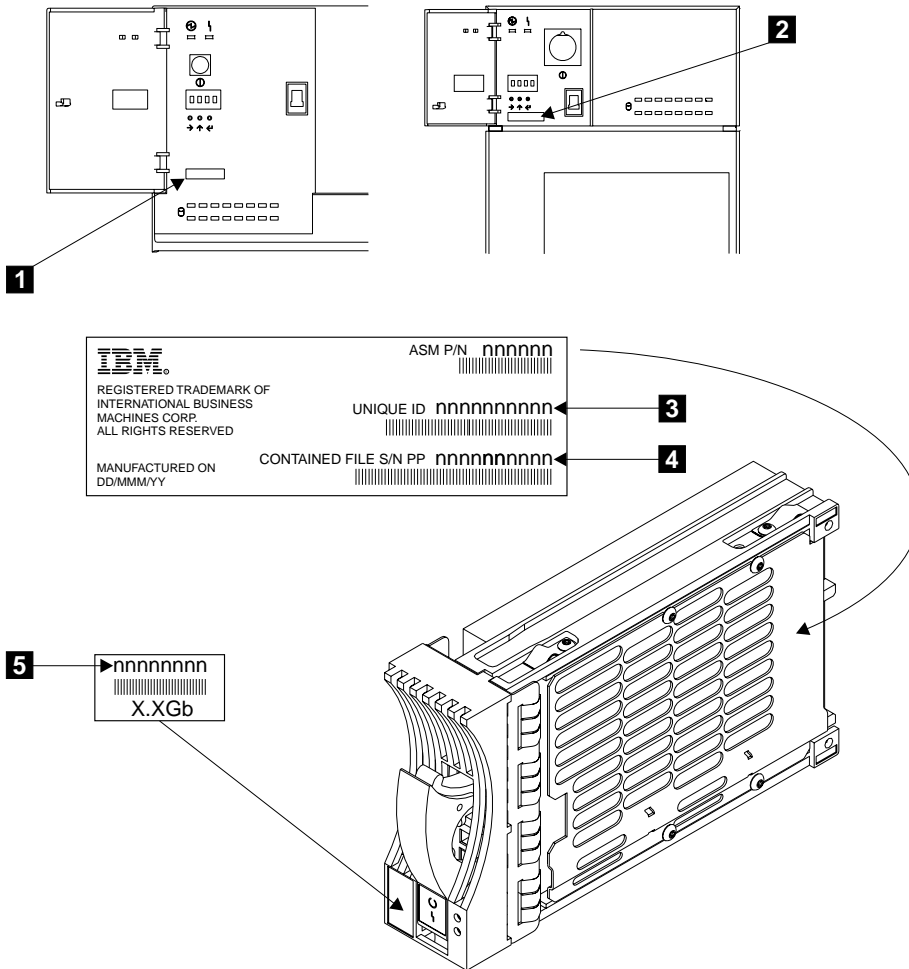
Figure 22. Serial-Number and SSA UID Labels

> **Note:** The 7133 Model D40 has a product-information label that is attached to the frame assembly.
>
> The 7133 Model T40 has two product-information labels; one is attached to the frame assembly, the other is attached to the inside of the back cover. The label that is attached to the back cover shows the correct information for the 7133.

Always refer to this label. ***Ignore the label that is on the frame assembly; it might not be correct.*** The frame assembly might have been exchanged during a repair operation.

Product Characteristics

Dimensions and Weight (Model D40)

Height	Width	Depth	Approximate Minimum Weight	Approximate Maximum Weight
171 mm	444 mm	737 mm	37.6 kg	55 kg
(6.7 in.)	(17.5 in.)	(29 in.)	(83 lb)	(121 lb)

Dimensions and Weight (Model T40)

Height	Width	Depth	Approximate Minimum Weight	Approximate Maximum Weight
610 mm	210 mm	861 mm	61.2 kg	77.5 kg
(24 in.)	(8.3 in.)	(33.9 in.)	(135 lb)	(171 lb)

AC and DC Input-Voltage Requirements

Power Supply Assembly Type	Voltage	Frequency
220 V	88 to 264 V ac or 240 to 375 V dc	47 to 63 Hz
		–
–48 V	–40 to –60 V dc	–

Environment

	Operating Environment	Nonoperating Environment	Storing Environment	Shipping Environment
Air temperature	10°C to 40°C (50°F to 104°F)	10°C to 52°C (50°F to 125°F)	1°C to 60°C (34°F to 140°F)	–40°C to 60°C (–40°F to 140°F)
Relative Humidity	8% to 80% noncondensing	8% to 80% noncondensing	5% to 80% noncondensing	5% to 100% condensing but not precipitating
Maximum wet bulb	27°C (80°F)	27°C (80°F)	29°C (84°F)	29°C (84°F)

Full information about cooling requirements for the 7133 Model D40 is given in the *7133 Models D40 and T40 Serial Disk Systems: Hardware Technical Information*. A summary of that information is given here.

- The recommended operating temperature is 22°C (72°F) or lower. At lower temperatures, the risk of failure in the 7133 is reduced. If the operating temperature is above 22°C (72°F) for long periods, the 7133 is exposed to a greater risk of failure from external causes.

- Each rack-mounted 7133 Model D40 requires an airflow of 2.5 m³ per minute (87 ft³ per minute). The input air temperature to all racks is recommended to be in the range 20 through 25°C (68 through 77°F).

  When racks containing many 7133s are to be installed together, the following requirements must be met to ensure that the 7133s are suitably cooled:

  - Air enters at the front of the rack and leaves at the back. To prevent the air that is leaving the rack from entering the intake of another piece of equipment, racks must be positioned in alternate rows, back-to-back and front-to-front. This arrangement is known as "Cold Aisle / Hot Aisle."

  - Where racks are in rows, each rack must touch the rack that is next to it to reduce the amount of hot air that can flow round from the back of the rack into the intakes of the 7133s that are in that rack. It is recommended that Suite Attach Kits be used to completely seal any gaps that remain between the racks. For details of Suite Attach Kits, contact your marketing representative.

  - Where racks are in rows front-to-front or back-to-back, a gap of at least 1220 mm (48 in) must separate the rows across the cold aisle.

  - Where cold air is supplied through perforated tiles or gratings in the floor, it is recommended that the front of racks be located on floor-tile seams. A full line of perforated tiles or gratings must be immediately in front of the racks. The underfloor temperature must not exceed 15°C (60°F).

    Air conditioners must be located where they can take their input from the hot aisle, and supply cooled air to the underside of the cold aisle perforated tiles or gratings. It is recommended that the air conditioners be located at the ends of the hot aisles. This requirement ensures that hot exhaust air cannot flow over the top of the racks and reenter at the front.

    The perforated tiles or gratings must be able to supply a suitable airflow for all the 7133s that are present in a rack. For example, if a T42 rack contains ten 7133s, and the air conditioners are located at the ends at the ends of the hot aisles, the airflow required is 19.8 m³ per minute (700 ft³ per minute). If the air conditioners are located in front of, or behind the racks, the airflow required for the example T42 rack is now 25.5 m³ per minute (900³ per minute).

  - To ensure correct airflow in each rack, the rack filler plates must be installed in unused positions. Also, all the gaps in the front of the racks must be sealed, including the gaps between the 7133s.

Altitude

	Operating Environment	Nonoperating Environment	Storing Environment	Shipping Environment
Altitude (from sea level)	0 to 2133 m (0 to 7000 ft)	−305 to 12 192 m (−1000 to 40 000 ft)	−305 to 12 192 m (−1000 to 40 000 ft)	−305 to 12 192 m (−1000 to 40 000 ft)

Heat Output (Maximum)

Minimum configuration (four disk drive modules)	140 watts (478 Btu per hour)
Maximum configuration (16 disk drive modules)	430 watts (1468 Btu per hour)

Sizes of Disk Drive Modules

The sizes that are given here for the different types of disk drive module apply when data is stored in 512-byte logical blocks.

Disk Drive Module Type	Speed (RPM)	Actual Formatted Size	512-Byte Blocks
4.5 GB	7200	4 512 701 440 bytes	8 813 870
9.1 GB	7200	9 111 591 424 bytes	17 796 077
9.1 GB	10 000	9 111 591 424 bytes	17 796 077
18.2 GB	7200	18 223 183 872 bytes	35 592 156
18.2 GB	10 000	18 223 183 872 bytes	35 592 156
18.2 GB	15 000	18 223 183 872 bytes	35 592 156
36.4 GB	7200	36 446 367 744 bytes	71 184 312
36.4 GB	10 000	36 446 367 744 bytes	71 184 312
36.4 GB	15 000	36 446 367 744 bytes	71 184 312
72.8 GB	10 000	72 892 735 488 bytes	142 368 624
145.6 GB	10 000	145 785 470 976 bytes	284 737 248

Limitations:

1. Various types of 10 000 rpm disk drives are available. Their actual speeds are in the range 9 991 through 10 091 rpm.

2. If the customer configures an @server pSeries™ volume group on a 15+P RAID-5 array that is using 72.8 GB disk drives, the customer must set the form factor to 2 or above. This action allows the number of physical partitions to be set inside the AIX® limit. If the customer does not do this action, the volume group fails to configure.

3. A pSeries RAID-0 volume group that uses 72.8 GB disk drives can contain no more than 15 of those disk drives.

4. On all disk drives, the adapter reserves 65 536 bytes for its own use.

5. Disk drive modules for 7133 Models 010, 020, 500, and 600 cannot be installed in 7133 Models D40 and T40. Also, disk drive modules for the 7133 Models D40 and T40 cannot be installed in 7133 Models 010, 020, 500, and 600.

Power Sequencing

The 7133 Models D40 and T40 have no power sequencing. All the disk drive modules start their power sequence when the input voltages are inside the specified limits. Their motors are started under control of the SSA attachments in the using system. To prevent the need for excessive electrical current, the disk drive module motors are not all started together. Up to eight disk drive modules can be started together. At least 10 seconds must elapse before the next group of motors is started. Normally, all the disk drive module motors are running in less than 30 seconds from the time the 7133 is switched on.

Disk Drive Acclimation

If you bring a disk drive module into the operating environment from an environment where the temperature is outside the specified operating range (see Environment), allow the disk drive module time to acclimate to the operating environment. Remove the disk drive module from any shipping packaging, but leave it in its sealed plastic bag (if present) to prevent condensation forming.

SSA Bypass Cards

The four bypass cards that are at the back of the 7133 Models D40 and T40 provide the connections between the external SSA cables and the disk drive module strings. Each bypass card has two external SSA connectors. Through these connectors, the bypass cards and, therefore, the disk drive module strings, can be connected to each other or to the using system.

The bypass cards can be jumpered for the following modes:
• Automatic mode
• Forced Inline mode

You can change the mode by changing the position of the jumpers (see "Bypass Card Jumpers" on page 45).

When a bypass card is in Automatic mode, you can select additional modes by using the 7133 service aids (see "7133 Models D40 and T40 Service Aids" on page 62) or the Command Line tools (see "Command Line Tools" on page 266). The additional modes are:
• Forced Inline mode
• Forced Bypass mode
• Forced Open mode

Note: The cards need not all be in the same mode.

Automatic Mode

When a bypass card is jumpered to operate in Automatic mode, it monitors both of its external connectors. If it detects that at least one of its connectors is connected to a powered-on SSA attachment or device, it switches to *Inline state*; that is, it connects the internal SSA links to the external connector.

If the bypass card detects that neither of its connectors is connected to a powered-on SSA attachment or device, it switches into *Bypass state*; that is, it connects the internal strings together, and disconnects them from the external connectors. Therefore, when a 7133 that has all its bypass cards jumpered for Automatic mode is not connected externally, all 16 disk drive module slots are connected in one internal SSA loop.

In figures 23 and Figure 24 on page 43, two strings of four disk drive modules in a 7133 are connected to two SSA adapters. If power is on at both adapters, the loop is connected as shown in Figure 23:
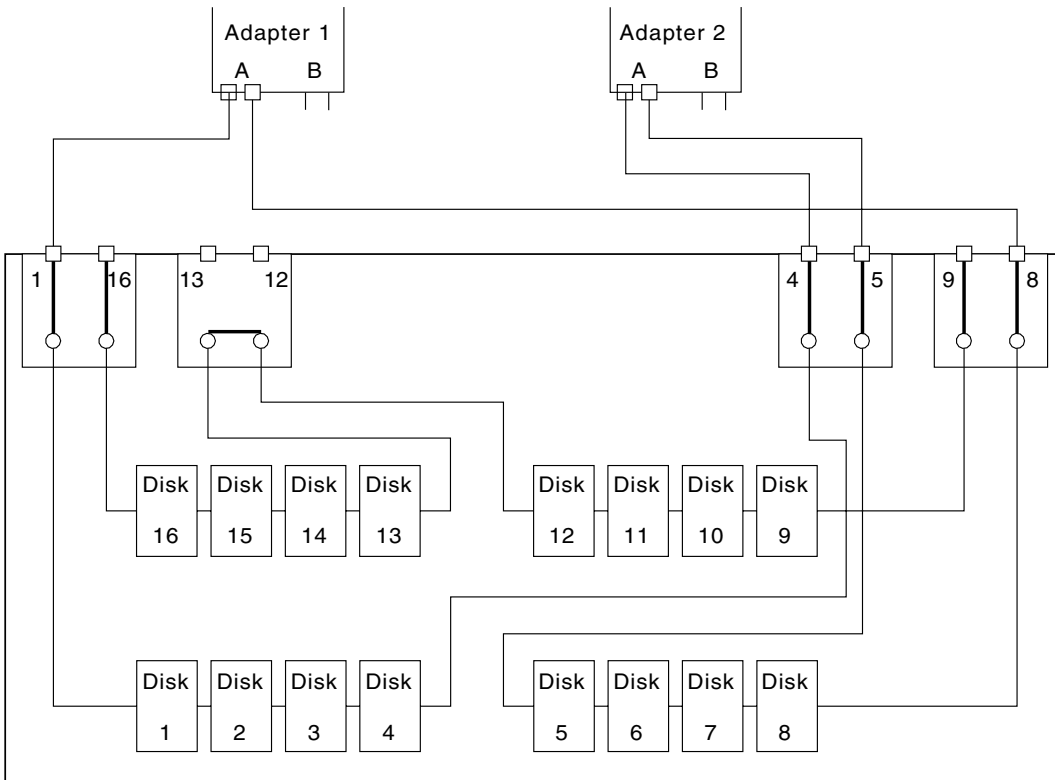
Figure 23. Automatic Mode: Power at Both SSA Adapters

If power is switched off to adapter 2, the loop is broken. The 7133 bypass card detects the loss of voltage, goes into bypass state, and reconnects the loop. Adapter 2 is bypassed as shown in Figure 24.
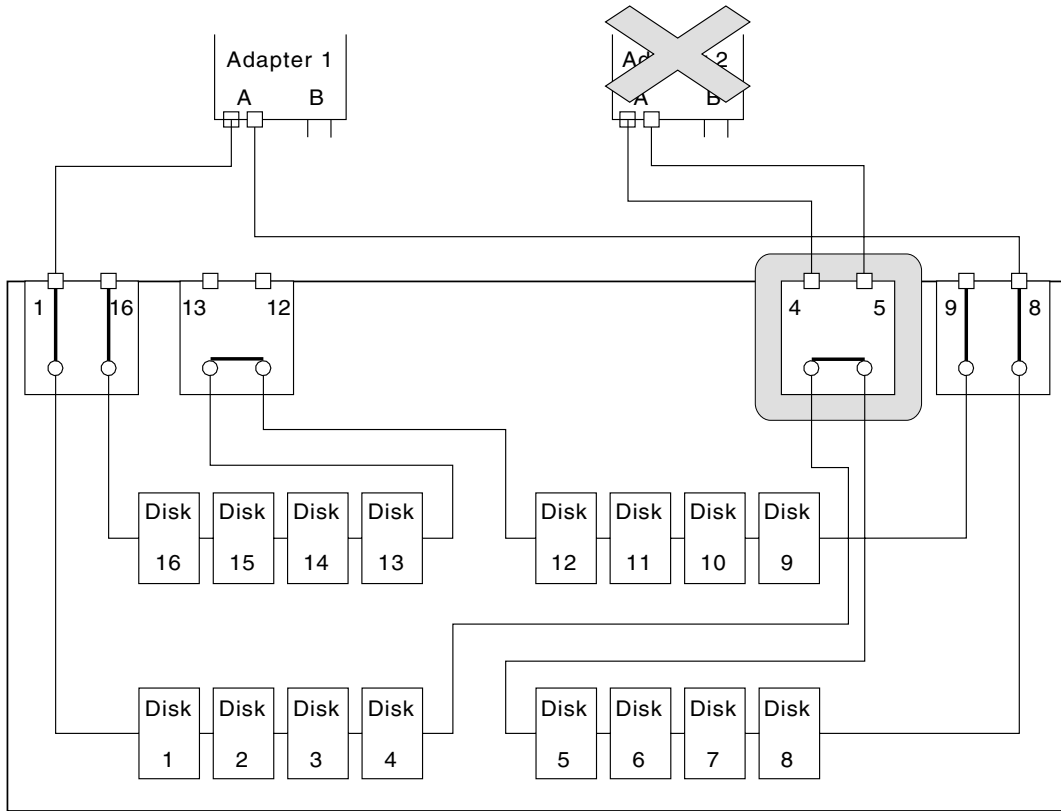
Figure 24. Automatic Mode: No Power at Adapter 2

Forced Inline Mode

When a bypass card is set to operate in Forced Inline mode, its Mode light is green, and its two Link Status (Ready) lights are off.

Forced Inline mode is used to disable the switching ability of selected bypass cards in particular types of subsystem configuration. The types of configuration that might require Forced Inline mode are those in which:

- Two 7133s are connected to each other. In this type of configuration, Forced Inline mode removes the risk that a fault condition might break the connection between the two 7133s. The second example in "Higher-Availability Configurations" on page 54 shows a typical configuration of this type.
- The disk drive modules in one 7133 are not all connected to the same SSA loop. In this type of configuration, Forced Inline mode removes the risk that a fault condition might cause the disk drive modules of different loops to be connected to each other.

Forced Inline mode can be set by:
* A command from the subsystem service aids
* A command from the command line tool
* Jumpers on the bypass card

If Forced Inline mode is set by the jumpers, the mode cannot be changed by the subsystem service aids or by the command line tool.

Forced Bypass Mode

When the bypass card is set for Forced Bypass mode, the disk drive modules that are on each side of the bypass card are connected to each other. (For example, in Figure 24 on page 43, disk drive modules 12 and 13 are connected together through the bypass card.) Connections that have been made to the external connectors of the bypass card have no effect. The disk drive modules that are on each side of the bypass card remain connected to each other.

A typical use for Forced Bypass mode is to ensure that the connection between disk drive modules that are on each side of the bypass card cannot be broken or changed by the addition of external cables.

Forced Open Mode

When the bypass card is set for Forced Open mode, no connections through this bypass card are active.

A typical use for Forced Open mode is to ensure that the interface is isolated.

Resetting Bypass Card Modes

If the bypass card modes have been set in such a way that the using system can no longer get access to the 7133, you cannot use the service functions to change those modes. You can, however, manually reset the modes to their default settings.

Attention: When you reset the modes manually, *all* bypass cards that are not jumpered for Forced Inline mode are reset to Automatic mode in this 7133. Your configuration might be seriously affected.

To reset the modes, hold all three ID push buttons (see "ID push buttons" on page 11) pressed until the display flashes after approximately 10 seconds. All bypass cards that are not jumpered for Forced Inline mode are reset to Automatic mode in this 7133.

Bypass Card Jumpers

Attention: The bypass cards are electrostatic-discharge (ESD) sensitive. Use the tools and procedures defined by your organization to protect such parts.

The base mode in which the bypass card operates is set by two jumpers. The default setting is for Automatic mode. The mode can be changed by relocating the jumpers. For instructions on how to remove a bypass card and change its mode, see "Bypass (SNBC) Cards" on page 201.

Jumpers Set for Automatic Mode

1   SSA connectors   **2**   Jumpers
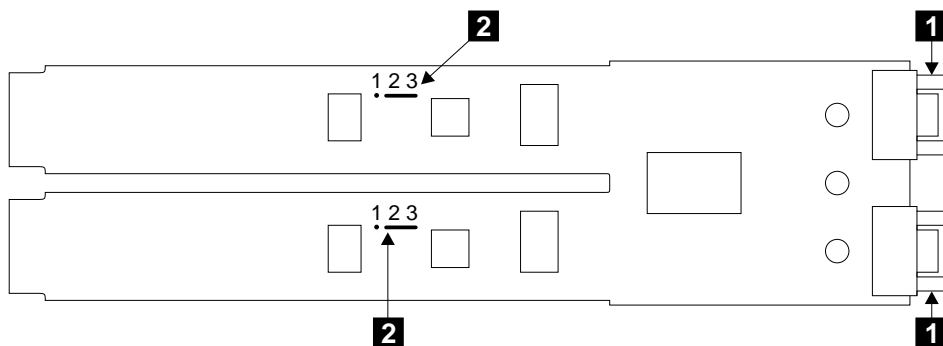
Figure 25. Bypass Card Jumpers Set for Automatic Mode

Jumpers Set for Forced Inline Mode

1 SSA connectors
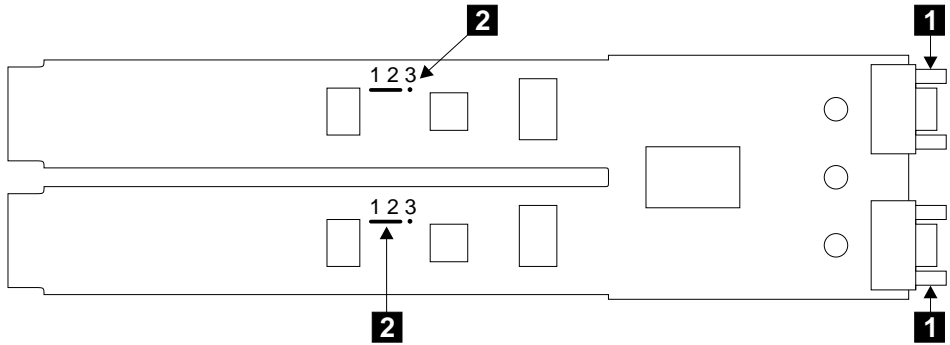
2 Jumpers

Figure 26. Bypass Card Jumpers Set for Forced Inline Mode

SSA Subsystem Configurations

The diagrams in this section show some sample configurations for the 7133. All the configurations that are shown here are the **simplest** and provide the best ease of use. If performance or availability are particularly important to the customer, however, **more complex cabling might provide a better solution**; consult your marketing representative for more details.

Under the standard SSA rules, you can mix any compatible SSA devices in a particular SSA loop.

Rules for SSA Loops

Details of the rules for configuring SSA loops are given in the user or maintenance information for your using-system SSA attachment hardware (see Related Publications in the additional information appendix (in this book) for your using system). SSA loops that include disk drives that are installed in a 7133 Model D40 or Model T40 must also follow these additional rules:

- A maximum of three dummy disk drive modules can be connected to each other in a particular SSA loop.
- The maximum permitted length for an external SSA cable that connects two SSA nodes (for example, disk drives) is 25 meters (82 feet).
- Under some conditions, the maximum permitted length for a fibre optic cable that connects two SSA nodes (for example, disk drives) is:
  - 3 kilometers (9842 feet) for multi-mode operations
  - 10 kilometers (32800 feet) for single-mode operations

Otherwise, the maximum permitted length for single-mode and multi-mode operations is 2.4 kilometers (7874 feet). See "Specifications for Fibre Optic Cables and Connectors" on page 26 for details.

Cable Configurations

In the diagrams, the SSA connectors are numbered. These connector numbers match those shown in "Internal Connections (Model D40)" on page 28 and "Internal Connections (Model T40)" on page 30.

Simplest Configuration

A 7133 that is in base configuration includes four disk drive modules. These modules are installed in slots 1 through 4 at the front of the 7133. The other 12 disk drive slots contain dummy disk drive modules. The disk drive modules are linked in groups of four. Each group of four modules is linked to two external SSA connectors.

In the simplest configuration, the SSA loop is completed by connecting these two SSA connectors to one of the two pairs of connectors on an SSA attachment in the using system (see Figure 27).
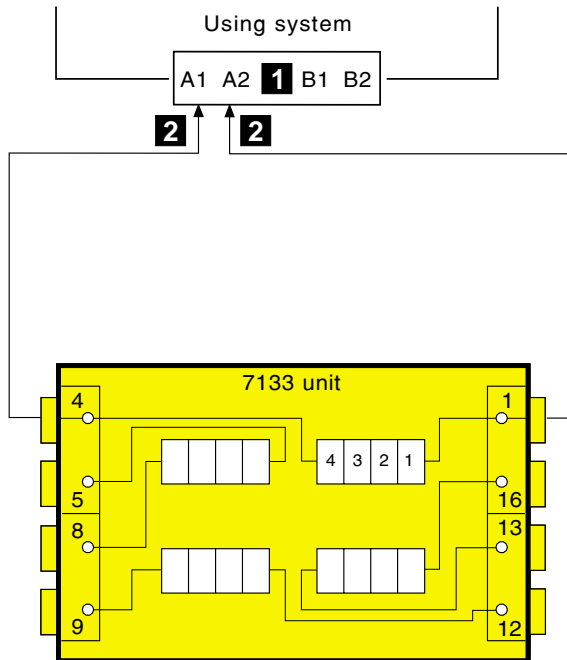
Figure 27. Simplest Configuration

No improvement in performance is gained if the disk drive modules are moved to other slots and connected in more than one loop.

The cables are described in "SSA Cables for 7133 Models D40 and T40" on page 56. The internal connections of the 7133 are shown in "Internal Connections (Model D40)" on page 28 and "Internal Connections (Model T40)" on page 30.

For information about the rules for SSA loops, see the "Rules for SSA Loops" on page 47.

Larger Configurations

Four more disk drive modules can be added to the base configuration in one loop. For a balanced subsystem, however, it is recommended that the two groups of disk drive modules be connected in two separate loops, each of which is connected to a separate pair of connectors on the SSA attachment (see Figure 28).
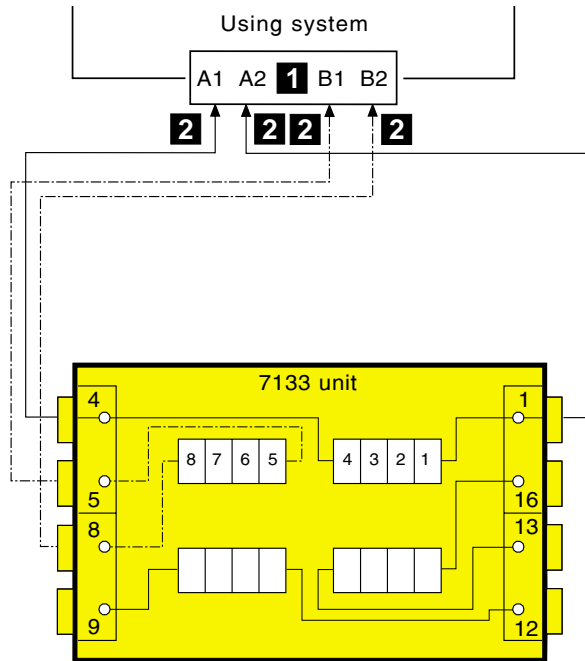
Figure 28. Larger Configuration

No improvement in performance is gained if the disk drive modules are moved to other slots and connected in more than two loops by way of an additional SSA attachment.

The cables are described in "SSA Cables for 7133 Models D40 and T40" on page 56. The internal connections of the 7133 are shown in "Internal Connections (Model D40)" on page 28 and "Internal Connections (Model T40)" on page 30.

For information about the rules for SSA loops, see the "Rules for SSA Loops" on page 47.

Largest Configurations with One 7133

All 16 disk drive modules in a full 7133 can be connected in one loop. For a balanced subsystem, however, it is recommended that two groups of eight disk drive modules be connected in two separate loops, each of which is connected to a separate pair of connectors on the SSA attachment (see Figure 29).
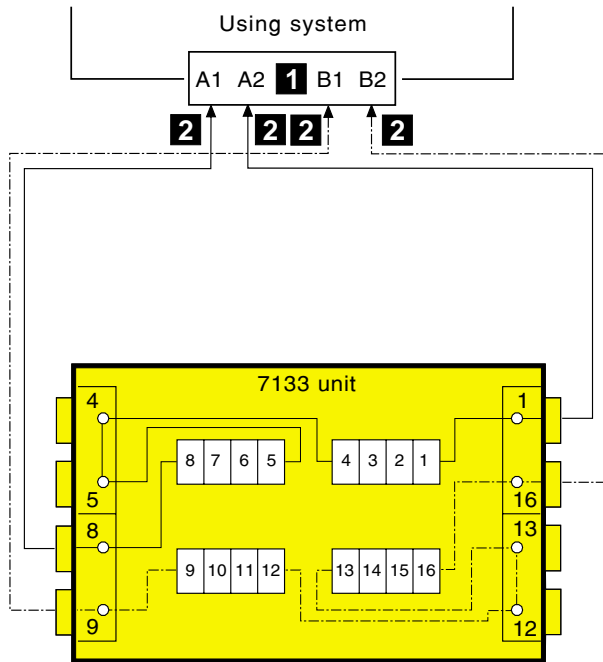
Figure 29. Largest Configuration with One 7133

No improvement in performance is gained if the disk drive modules are connected in more than two loops by way of an additional SSA attachment.

The cables are described in "SSA Cables for 7133 Models D40 and T40" on page 56. The internal connections of the 7133 are shown in "Internal Connections (Model D40)" on page 28 and "Internal Connections (Model T40)" on page 30.

For information about the rules for SSA loops, see the "Rules for SSA Loops" on page 47.

Multiple-Unit Configurations

An SSA subsystem can include disk drive modules that are installed in more than one 7133. You can connect up to 48 disk drive modules in one loop, and up to 96 disk drive modules to one SSA attachment.

In larger subsystems, unless the work load of the system has special requirements, best performance is obtained if you connect equal numbers of disk drive modules to the loops that are available. In the following example, 32 disk drive modules are connected to an SSA attachment. They can all be connected in one loop, but for better performance and better serviceability, it is recommended that the disk drive modules be connected in two loops, each of which is connected to a separate pair of connectors on the SSA attachment (see Figure 30).
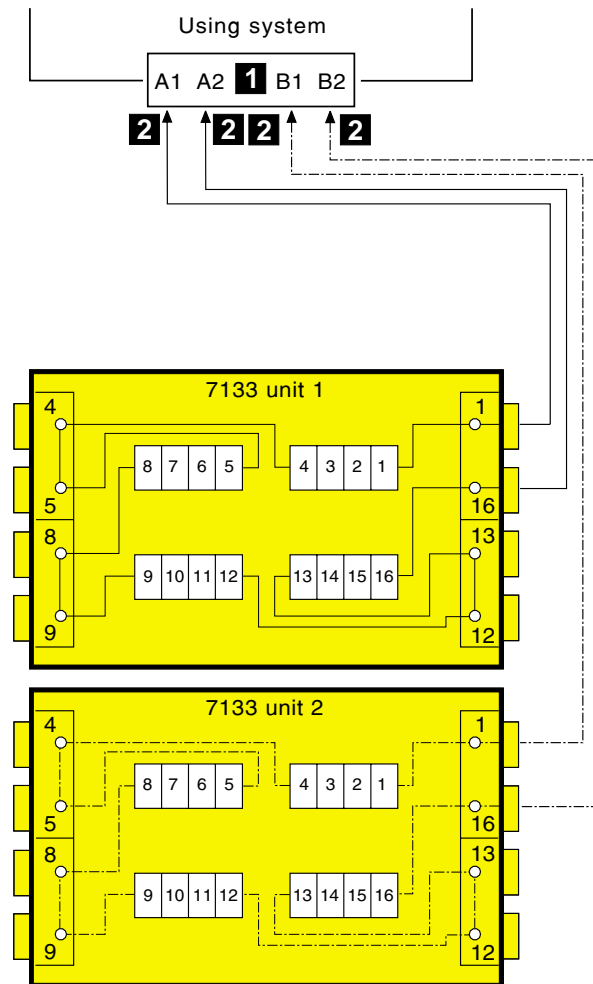
Figure 30. Multiple-Unit Configuration (Two 7133s)

The cables are described in "SSA Cables for 7133 Models D40 and T40" on page 56. The internal connections of the 7133 shown in "Internal Connections (Model D40)" on page 28 and "Internal Connections (Model T40)" on page 30.

For information about the rules for SSA loops, see the "Rules for SSA Loops" on page 47.

Figure 31 shows 96 disk drive modules, in six 7133s, connected to one SSA attachment.
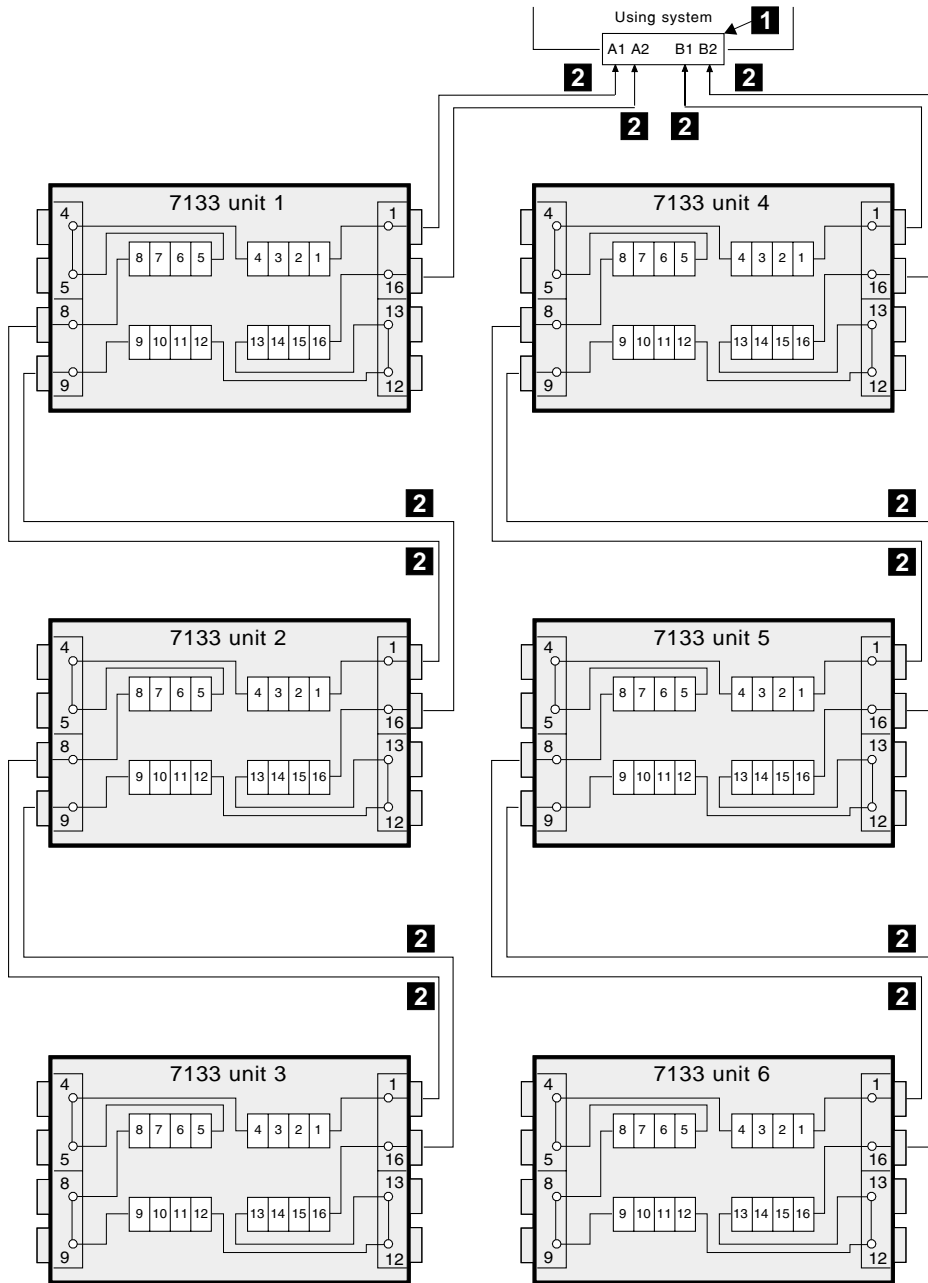
Figure 31. Multiple-Unit Configuration (Six 7133s)

Higher-Availability Configurations

For higher availability, you can connect more than one SSA attachment in an SSA loop, if the attachments allow such a configuration.

In loops that have multiple SSA attachments, you can often get best performance if you connect the attachments as equally as possible between the disk drive modules.

Figure 32 shows one 7133 connected in one loop with two SSA attachments.
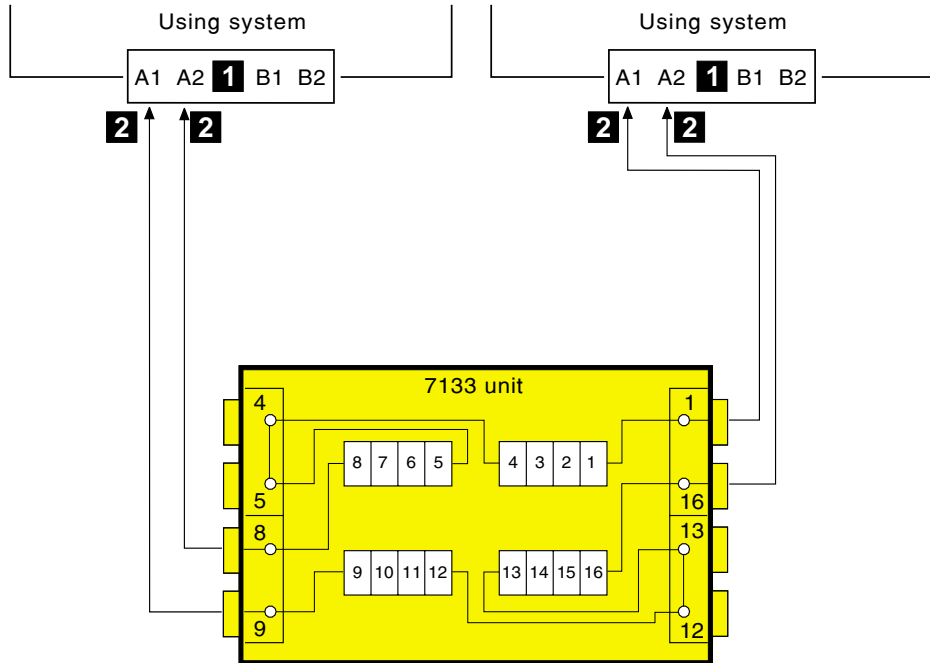
Figure 32. Higher-Availability Configuration (One 7133)

The cables are described in "SSA Cables for 7133 Models D40 and T40" on page 56. The internal connections of the 7133 are shown in "Internal Connections (Model D40)" on page 28 and "Internal Connections (Model T40)" on page 30.

For information about the rules for SSA loops, see the "Rules for SSA Loops" on page 47.

Figure 33 on page 55 shows three 7133s connected in one loop with six SSA attachments. The broken line represents optional cables that provide additional availability if a fault occurs.
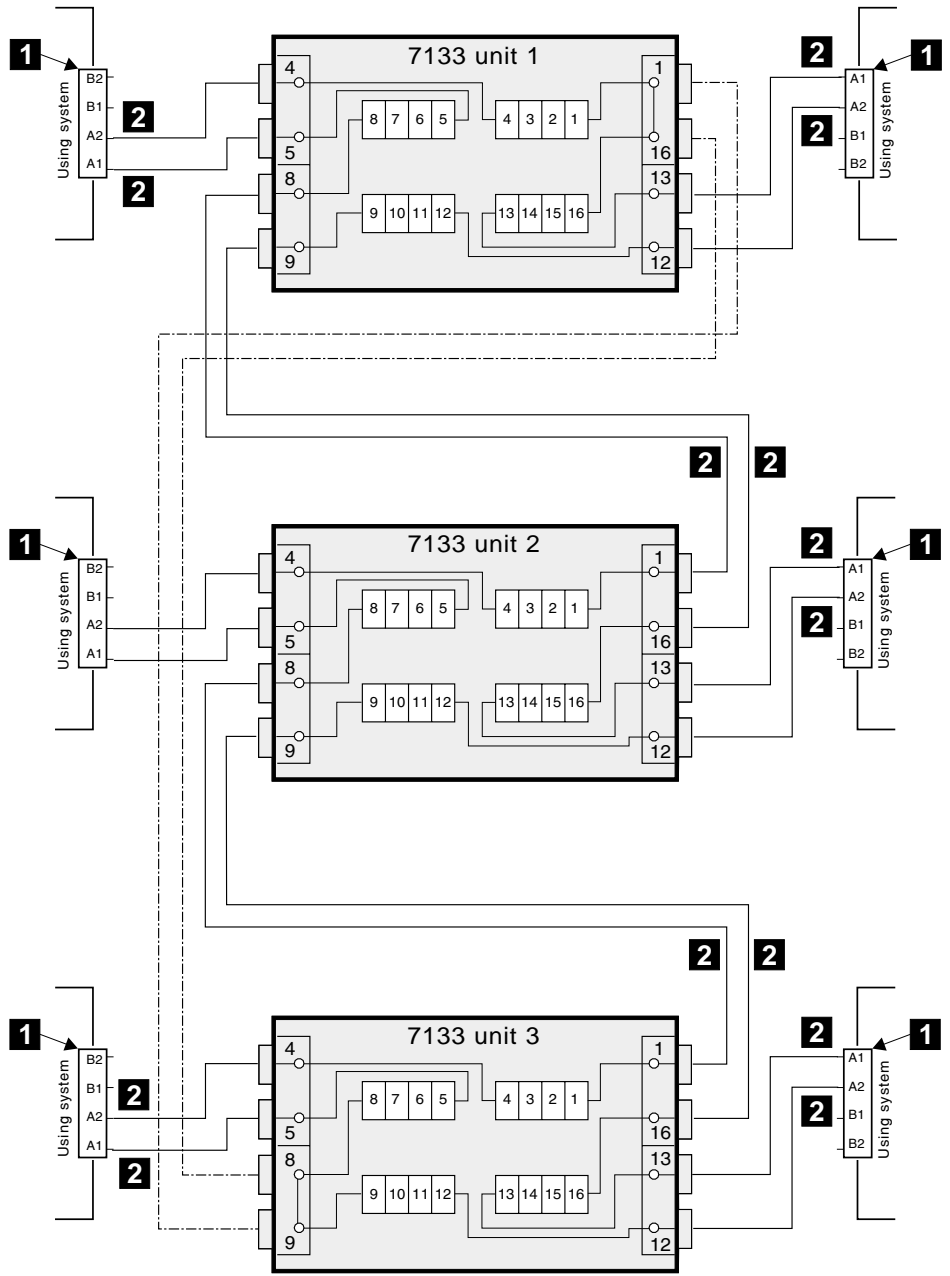
Figure 33. Higher-Availability Configuration (Three 7133s)

SSA Cables for 7133 Models D40 and T40

Table 5 shows the part numbers of the cables that are shown in the sample configurations.

Table 5. SSA Cables

Item	Part	Description
1	–	Using-system SSA attachment hardware For information about the various types of SSA attachment hardware, see the user or maintenance information for your using-system SSA attachment hardware.
2	08L7908 08L7909 08L7910 08L7911 08L7912	External SSA copper cable, 1.0 m (3.3 ft) External SSA copper cable, 2.5 m (8.2 ft) External SSA copper cable, 5.0 m (16.4 ft) External SSA copper cable, 10 m (32.8 ft) External SSA copper cable, 25 m (82.0 ft) **Attention:** The correct SSA copper cables for the 7133 Models D40 and T40 are colored blue.

Note: If the 7133 has the Advanced SSA Optical Extender (Pair) feature, fibre optic cables can be used instead of the standard SSA copper cables.

Preventing the Isolation of Disk Drives in Higher-Availability Configurations

If a loop contains four SSA attachments, with two attachments in each of two using systems, disk drive modules become isolated if they are connected between the two SSA attachments of one using system, and both those attachments fail, or are held reset, **but remain powered on**.

Bypass Note: A bypass card switches the internal strings of the 7133 only if it detects that neither of its connectors is connected to a powered-on SSA attachment or device. Therefore, if the two SSA attachments fail, or are held reset, but remain powered on, the bypass card does not operate, and the disk drive modules become isolated.

In Figure 34, SSA attachments **1** and **2** are in using system 1; SSA attachments **3** and **4** are in using system 2. In each using system, the two SSA attachments are connected to each other.

If the two SSA attachments of either using system fail, or are held reset, but remain powered on, all the disk drive modules can still communicate with the other using system.
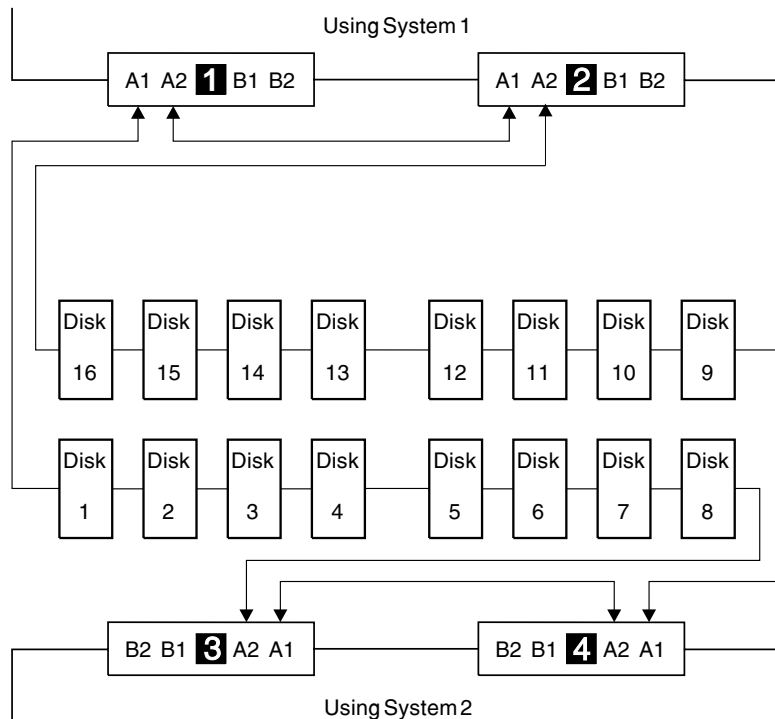
Figure 34. One Loop, Two SSA Attachments in Each of Two Using Systems

If, however, disk drive modules are connected into the link between two SSA attachments that are in the same using system, those disk drive modules become isolated if both SSA attachments fail, or are held reset, but remain powered on (see also "Bypass Note" on page 57). In Figure 35, disk drive modules 13 through 16 have been connected between the SSA attachments in using system 1. If both attachments fail, or are held reset, but remain powered on, disk drives 1 through 12 can still communicate with using system 2. Disk drives 13 through 16, however, cannot communicate with using system 2, because their data paths are through the SSA attachments in using system 1. When using system 1 is rebooted, disk drives 13 through 16 remain unavailable for a long time.
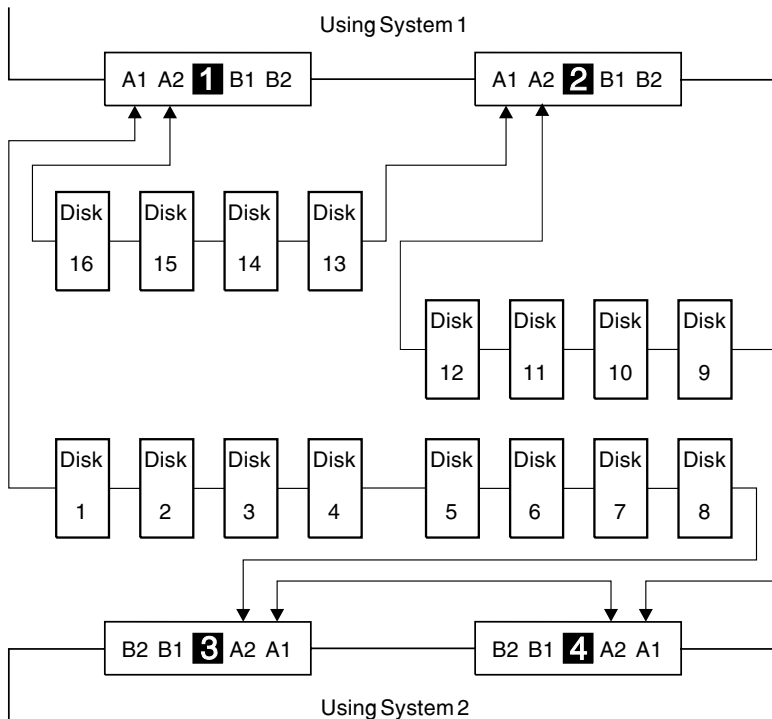
Figure 35. Disk Drive Modules Isolated by Failing Using System

Physical Location of a Device

The SSA address of a device is related to the position of that device on the SSA loop. The address can, therefore, change if the configuration is changed.

You can determine the physical location of a particular disk drive module that is present in a 7133 Model D40 or Model T40 if you use:

- The system service aids (see Service Aids in the additional information appendix (in this book) for your using system)
- Other service aids
- No service aids

See "Finding the Device When Service Aids Are Available" and "Additional Device Location Information".

Finding the Device When Service Aids Are Available

To help you to find the correct physical disk drive, the SSA service aids include an Identify function. This function, when selected, causes the Check light of the selected disk drive module to flash. It also causes the Subsystem Check light to flash on the 7133 that contains the selected module. For more details, see the chapter on SSA Service Aids in the user or maintenance information for your using-system SSA attachment.

Some devices, (for example, SSA adapters) do not have Check lights. To find such a device, you can either use the Identify function to identify devices that are next to the SSA adapter on the SSA loop, or use the procedure described in "Additional Device Location Information".

Additional Device Location Information

You can find the device by using the Port (P) and SSA-address (AA) values that are provided by some service request numbers (SRNs). Examples of these SRNs are 43PAA, 44PAA, and 45PAA.

The Port (P) value can be a number 0 through 3. It indicates the port connector on the SSA attachment:

```
0 = Connector A1
1 = Connector A2
2 = Connector B1
3 = Connector B2
```

The AA value is the decimal SSA-address value. It indicates the position of the device that you are trying to find (counted *around* the SSA loop).

Use the PORT value to locate the relevant connector on the SSA attachment, then follow the SSA cable to the first *real* device. Include other SSA attachments as real devices if they are in the same SSA loop. Do not include dummy devices or bypass cards.

The first device that you reach (possibly a device in a 7133) represents SSA-address count 0. Continue to follow the SSA loop from device to device, increasing the SSA-address count by 1 for each device, until you reach the device that is indicated in the SRN.

Note: Refer to the diagrams in "SSA Subsystem Configurations" on page 47 to ensure that you follow the SSA loop and count the devices in the correct sequence.

Controller Card Microcode Maintenance

When a new level of controller card microcode becomes available, that microcode is supplied on media that are appropriate for your using system. The media contain both the new level of microcode and the existing level. The current level is supplied so that if any problems occur with the new level, you can return to the existing working level.

A README file that contains download instructions is supplied with the microcode.

The download service aid that is supplied with the new level of microcode provides two types of download function:

- Temporary. This type of download function downloads the new microcode into RAM and activates it. When the controller card is next powered off, then powered on, the new microcode is lost, and the original microcode is used.
- Permanent. This type of download function downloads the microcode into RAM and EEPROM.

See also Controller Card Microcode Maintenance in the "Additional Information" appendix (in this book) for your using system.

To update the 7133 vital product data (VPD) that is held in the using system, you might need to reconfigure the 7133 to the using system. For more details, see Configuring a 7133 to the Using System in the "Additional Information" appendix (in this book) for your using system.

Disk Drive Microcode Maintenance

When a new level of disk drive microcode becomes available, that microcode is supplied on media that are appropriate for your using system. For instructions about how to download the microcode, see Downloading Disk Drive Microcode in the "Additional Information" appendix (in this book) for your using system.

Vital Product Data (VPD)

You can display the vital product data (VPD) for 7133 Models D40 and T40 by using the service aids. This section shows the types of information that are contained in the VPD.

Abbreviations used in this section are:

FRU	Field-replaceable unit
RAM	Random-access memory
ROM	Read-only memory
ROS	Read-only storage
SSA	Serial storage architecture

SSA Disk Drives

Part number	Disk drive FRU part number
EC level	Disk enclosure engineering change level
Serial number	Disk enclosure serial number
Machine type and model	Type and model
Manufacturer	Manufacturer and plant code
ROS Level and ID	ROM and RAM code revision levels
Device specific Z2	RAM code load part number
Device specific Z3	Disk drive FRU part number
Device specific Z4	Disk enclosure date of manufacture

7133 Models D40 and T40

Part number	Controller card assembly FRU part number
EC Level	Controller card assembly engineering change level
Serial number	Controller card assembly serial number
Manufacturer	Manufacturer and plant code
ROS Level and ID	ROM and RAM code revision levels
Description of function	SSA_ENCLOSURE
Display Data (Z0)	Enclosure ID
Bypass (Z1)	BYPASS1_16 = FRU part number
Bypass (Z2)	BYPASS1_5 = FRU part number
Bypass (Z3)	BYPASS1_9 = FRU part number
Bypass (Z4)	BYPASS1_13 = FRU part number
Fan (Z5)	FAN_1 = FRU part number
Fan (Z6)	FAN_2 = FRU part number
Fan (Z7)	FAN_3 = FRU part number
PSU (Z8)	PSU_1 = FRU part number
PSU (Z9)	PSU_2 = FRU part number
Controller (ZA)	CTRL = FRU part number
Operator panel (ZB)	OPERATOR = FRU part number

You can use the command line tools to display the VPD for each FRU. Each FRU has the following VPD available:

Part Number	FRU part number
Assembly Number	Card level assembly part number
Serial Number	Card assembly serial number
EC Number	Card assembly engineering change level
Product ID	Subsystem product ID

Note: The fan assemblies have only Part Number available.

Service Functions

The 7133 Models D40 and T40 provide support for SCSI Enclosure Services (SES). These services enable you to get detailed data from a particular 7133 Model D40 or Model T40, and to change specific settings in that 7133. To do these actions, you use the 7133 Models D40 and T40 service aids or the 7133 Models D40 and T40 command line tools. For information about the command line tools, see "Command Line Tools" in the "Additional Information" appendix (in this book) for your using system.

7133 Models D40 and T40 Service Aids

The system service aids allow you to display the following:
- Loop and link configuration information
- Enclosure configuration information
- Enclosure environment information
- Change enclosure settings information

These service aids also allow you to change the enclosure settings.

For more information, see Service Aids in the "Additional Information" appendix (in this book) for your using system.

Loop and Link Configuration Information
For a selected SSA attachment, the service aids display:
- All the SSA nodes that are connected on each of the loops
- The speed and type of each node connection
- The ID of the 7133 in which each disk drive is located
- The location of each disk drive that is in the 7133
- The modes and states of each 7133 port

Enclosure Configuration Information
For a selected 7133 Model D40 or Model T40, the service aids display:
- The contents (device, dummy device, or empty) of each position (slot) in the 7133
- The speed and type of each external connection
- Whether the disk drive or bypass card has been exchanged
- The modes and states of each bypass card port by number

Enclosure Environment Information

For a selected 7133 Model D40 or Model T40, the service aids display the status of:
- Power supply assemblies
- Fan assemblies
- Operator panel
- Remote-Power-On control unit
- Controller card assembly
- Ambient temperature

Change Enclosure Settings Information

For a selected 7133 Model D40 or Model T40, the service aids allow you to change the following settings:
- Enclosure ID.
- Bypass card mode (Automatic, Forced Inline, Forced Bypass, and Forced Open).
- Temperature warning levels (low and high).

You can also reset the Exchanged and Swap flags for the FRU.

Note: The Exchanged and Swap flags show whether a FRU has been removed or exchanged since its flag was last reset. These flags are especially useful if you are trying to solve an intermittent problem that might be caused by more than one FRU.

Service Inspection Guide

This inspection guide helps you to identify possible unsafe conditions on 7133 Models D40 and T40. Each 7133 has the necessary safety items installed to protect users and service personnel from injury. This guide addresses only those items. You should use your good judgment, however, to identify possible safety hazards that are not covered by this guide.

If any unsafe conditions are present, you must determine how serious the possible hazard could be, and whether you should continue without first correcting the problem.

Consider the following conditions and the safety hazards they present:

- **Electrical hazards (especially primary power):** Primary voltage on the frame can cause serious or lethal electrical shock.
- **Explosive hazards:** A bulging capacitor can cause serious injury.
- **Mechanical hazards:** Loose or missing items (for example, nuts and screws) can cause serious injury.

Using the following inspection checklist as a guide, inspect the 7133 for unsafe conditions. See, if necessary, any suitable safety publications.

Inspection Checklist

1. Remove all power from the 7133 (see "All Power" on page 145).
2. Check the frame for damage (loose, broken, or sharp edges).
3. Check the power cables and ensure that:
    a. The third-wire ground connector is in good condition. Use a meter to check that the third-wire ground continuity is 0.1 ohm or less between the external ground pin and the frame ground.
    b. The insulation is not worn or damaged.
4. Check for any obvious nonstandard changes. Use good judgment about the safety of any such changes.
5. Check inside the 7133 for any obvious unsafe conditions, such as metal particles, water or other fluids, or marks of overheating, fire, or smoke damage.
6. Check for worn, damaged, or pinched cables.
7. Ensure that the voltage specified on the product-information label matches the specified voltage of the electrical power outlet. If necessary, verify the voltage.
8. Inspect the power supply assemblies, and check that the fasteners in the cover of the power-supply unit (screws or rivets) have not been removed or disturbed.
9. Before connecting the 7133 to the using system, check the grounding as described in "Checking the Grounding of the 7133" on page 65.

Checking the Grounding of the 7133

This section has two subsections:

- "Grounding Check (Model D40)"
- "Grounding Check (Model T40)" on page 69.

Go to the appropriate subsection for the 7133 that you are servicing.

Grounding Check (Model D40)

1. Refer to Figure 36.
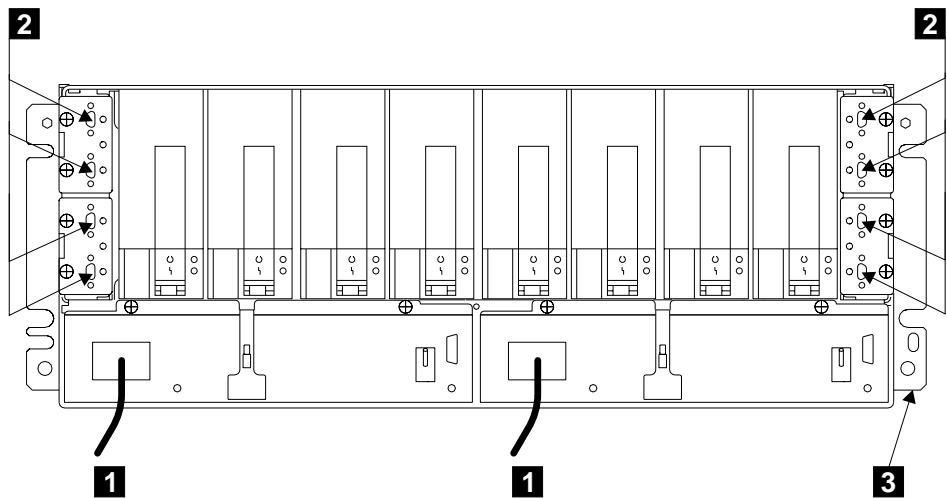
Figure 36. Power Cables and SSA Sockets (Model D40)

2. Ensure that all power is removed from the rack (see the *Installation and Service Guide*, or equivalent, for the rack or using system).
3. Ensure that the power cables **1** are plugged into each power supply assembly. Ensure also that the other ends of the power cables are connected to the power supply in the rack (see the *Installation and Service Guide*, or equivalent, for the rack or using system).
4. **Attention:** Some electrical circuits could be damaged if the external SSA cables or power-control cables are present at the 7133 while the grounding check is being done.

   Ensure that no external SSA cables are present at the eight connectors **2** .
5. If the 7133 has a Remote Power On Control feature, go to step 6 on page 66. Otherwise, go to step 8 on page 66.

6. Refer to Figure 37.

Figure 37. Remote-Power-On Control Unit

7. If the 7133 has a Remote Power On Control feature, ensure that no using system power-control cables are present at the MAIN and AUX connectors **1** .

8. Follow your local procedures and check the grounding of the 7133. Any test equipment must be connected to the *frame of the 7133* (**3** in Figure 36 on page 65).

   If the grounding is correct, go no further with these instructions.

   If the grounding is not correct, unplug the power cables from the power supply assemblies in the 7133.

   If you are servicing a 220-volt 7133, go to step 9 on page 67.

   If you are servicing a −48 volt 7133, go to step 12 on page 67.

9. Refer to Figure 38.

Figure 38. Ground Pin (Model D40: 220 V)

10. Check for continuity between the **frame of the 7133** and the **ground pin** 1 of each mainline-power connector.
11. Go to step 15.
12. Refer to Figure 39.

Figure 39. Ground Pins (Model D40: −48 V)

13. Check for continuity between the **frame of the 7133** and the **ground pins** 1 and 7 of each mainline-power connector.
14. Go to step 15.
15. If any power supply assembly has no continuity, exchange that power supply assembly for a new one (see "Power Supply Assemblies" on page 162), then do the complete grounding check again.

   If each power supply assembly has continuity, you might have a problem with the power cable or with the grounding of the using system.

   If you are servicing a 220-volt 7133, go to step 16.

   If you are servicing a −48 volt 7133, see the rack, or using-system, *Installation and Service Guide*, or equivalent, to isolate the fault, then do the complete grounding check again.

16. Check the power cable for continuity.

If the power cable does not have continuity, exchange it for a new one, then do the complete grounding check again.

If the power cable does have continuity, see the rack, or using-system, *Installation and Service Guide*, or equivalent, to isolate the fault.

Grounding Check (Model T40)

1. Refer to Figure 40.
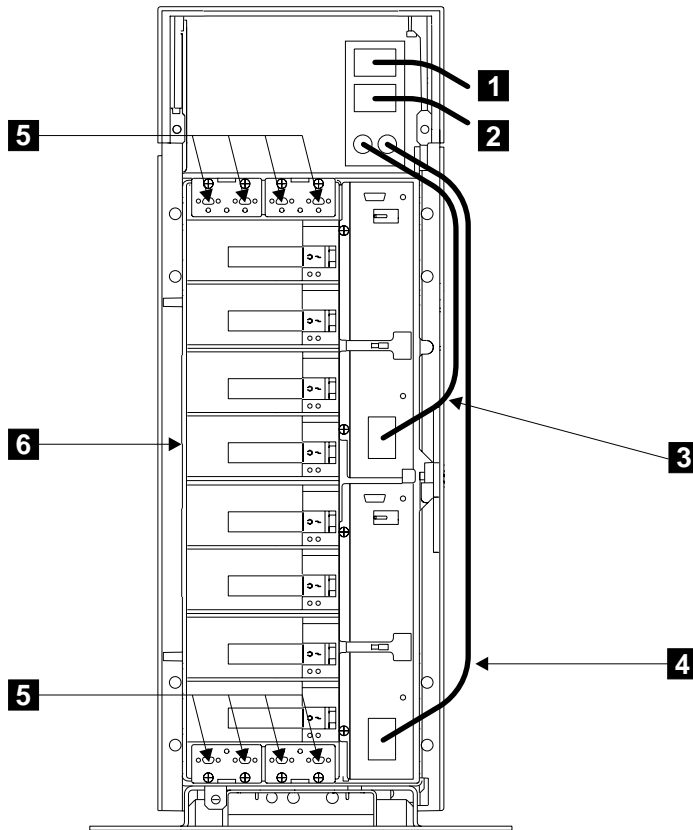
Figure 40. Power Cables and SSA Sockets (Model T40)

2. At the back of the 7133, ensure that the short cables **3** and **4** are plugged into the power supply assemblies, and that a power cable is plugged into each of the power sockets **1** and **2** .

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

4. **Attention:** Some electrical circuits could be damaged if the external SSA cables or power control cables are present at the 7133 while the grounding check is being done.

   Ensure that no external SSA cables are present at the eight connectors **5** .

5. If the 7133 has a Remote Power On Control feature, go to step 6 on page 70. Otherwise, go to step 8 on page 70.
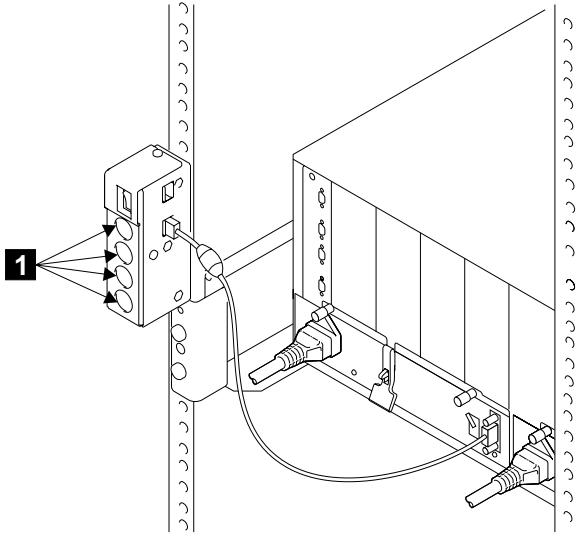
6. Refer to Figure 41.
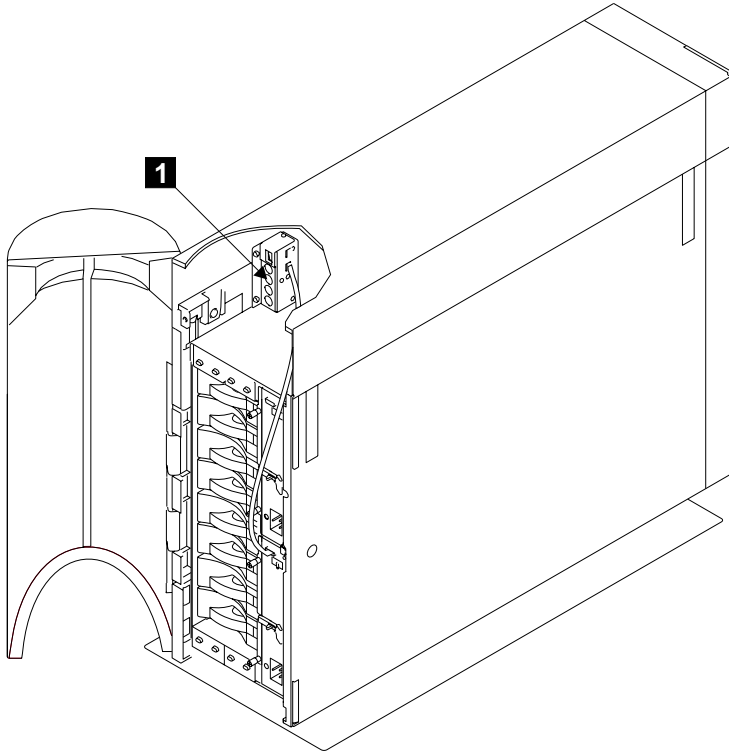
Figure 41. Remote-Power-On Control Unit

7. If the 7133 has a Remote Power On Control feature, ensure that no using system power-control cables are present at the MAIN and AUX connectors **1** .

8. Check for continuity between the *frame of the 7133* (**6** in Figure 40 on page 69) and the *ground pin* of each power cable.

9. If the continuity is good, the grounding of the 7133 is correct. Go no further with these instructions.

10. If the grounding is not correct, unplug the power cables from the mainline power connectors at the top of the 7133. Then continue with step 11.
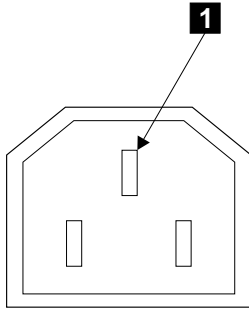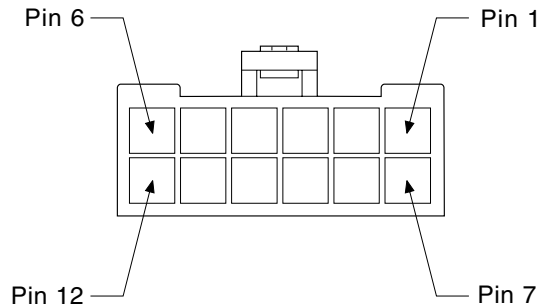
11. Refer to Figure 42.
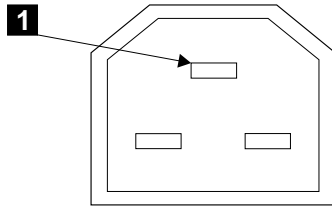
Figure 42. Ground Pin (Model T40)

12. Check for continuity between the **frame of the 7133** and the **ground pin 1** of each mainline power connector at the top of the 7133.
13. If both mainline power connectors have continuity, go to step 14.

    If one or both mainline power connectors do not have continuity, go to step 16.
14. Check each power cable, for continuity.
15. Exchange the failing power cable for a new one, then do the complete grounding check again.
16. Unplug the short cables (**3** and **4** in Figure 40 on page 69), and check for continuity between the **frame of the 7133** and the **ground pin** of the power connector on each power supply assembly (see Figure 19 on page 33).
17. If either power supply assembly does not have continuity, exchange that power supply assembly for a new one (see "Power Supply Assemblies" on page 162), then do the complete grounding check again.

    If both power supply assemblies have continuity, the power switch and cable assembly is failing. Exchange the power switch and cable assembly for a new one (see "Power Switch and Cable Assembly (Model T40)" on page 190), then do the complete grounding check again.

Chapter 2. Problem Determination Procedures

Are You Using the Correct Book? *Do not use this book if you are servicing a 7133 Model 010, 020, 500, or 600 SSA Disk Subsystem.* For the correct book, see Related Publications in the "Additional Information" appendix (in this book) for your using system.

Problem determination procedures are provided by power-on self-tests (POSTs), service request numbers, and maintenance analysis procedures (MAPs). Some of these procedures use the service aids that are described in the user or maintenance information for your using-system SSA attachment.

Disk Drive Module Power-On Self-Tests (POSTs)

The disk drive module POSTs start each time the module is switched on, or when a Send Diagnostic command is received from the SSA attachment. They check whether the disk drive module is working correctly. The POSTs also help verify a repair after a FRU has been exchanged.

The tests are POST-1 and POST-2.

POST-1 runs immediately after the 'power-on reset' line goes inactive, and before the disk drive module motor starts. POST-1 includes tests of:
- Microprocessor
- ROM
- Safety circuits.

If POST-1 completes successfully, POST-2 is enabled.

If POST-1 fails, the disk drive module Check light stays on, and the disk drive module is not configured into the SSA network.

POST-2 runs after the disk drive module motor has started. POST-2 includes tests of:
- Motor control
- Servo control
- Read and write on the diagnostic cylinder (repeated for all heads)
- Error checking and correction (ECC).

If POST-2 completes successfully, the disk drive module is ready for use with the system.

Controller Card Power-On Self-Tests (POSTs)

The controller card POSTs start each time power is switched on, or when a **Reset** command is sent from the using-system SSA attachment. They check only the internal components of the controller card; they do not check any interfaces to other FRUs.

If the POSTs complete successfully, control passes to the functional microcode of the controller card. This microcode checks all the internal interfaces of the 7133, and reports failures to the using system.

If the POSTs fail:

- All the fans are set to full speed.
- The Controller Card Check light and the 7133 Check light come on.
- If the failure occurs at the 7133 power-on time, the bypass cards go into Automatic mode (the default mode) unless they are jumpered for Forced Inline mode.
- The functional operation of the 7133 is not affected. For example, the customer still has access to all the disk drive modules.
- The failure is reported:
  - If the failure occurs at system bringup time, the using system detects that the 7133 is missing, and reports an error.
  - If the failure occurs at any time other than system bringup time, the hourly health check reports the failure.

Service Request Numbers (SRNs)

Service request numbers (SRNs) are generated for the 7133 Models D40 and T40 by the system error-log analysis, system configuration code, diagnostics, and customer problem-determination procedures. SRNs help you to identify the cause of a problem, the failing field-replaceable units (FRUs), and the service actions that might be needed to solve the problem.

The SRN Table

The table in this section lists the SRNs and describes the actions you should do. The table columns are:

SRN   The service request number.

FRU list   The FRU or FRUs that might be causing the problem (see also "FRU Names Used in the SRN Table" on page 76), and how likely it is (by percentage) that the FRU is causing the problem.

Problem   A description of the problem and the action you must take.

Abbreviations used in the table are:

FRU   Field-replaceable unit

PAA   P = Attachment port number
      AA = SSA address

      (see also "Additional Device Location Information" on page 59)

Using the SRN Table

Important: You should have been sent here from MAP 2010: 7133 Models D40 and T40 – START. Do not start problem determination from the SRN table; always go to "MAP 2010: 7133 Models D40 and T40 – START" on page 87 first.

1. Locate the SRN in the table. *If you cannot find a particular SRN in the table*, go to the SRN list that is in the user or maintenance information for your using-system SSA attachment. If you still cannot find the SRN, you have a problem with the diagnostics, the microcode, or the documentation. Call your support center for assistance.

2. Read carefully the "Action" you must do for the problem. *Do not exchange FRUs unless you are instructed to do so.*

3. Normally exchange only one FRU at a time, starting from the top of the FRU list for that SRN. Always use instructions given in Chapter 3, "Removal and Replacement Procedures" when exchanging FRUs; a page reference is given with each FRU in the FRU list. After each FRU is exchanged, go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

FRU Names Used in the SRN Table

This section provides a glossary of the FRU names used.

FRU Name in Table	Definition
Frame assembly	*The frame of the 7133 and the backplanes and cables that it contains.*
Disk drive module	*A disk drive attached to a carrier that plugs into one of the backplanes of the 7133.*
External SSA cable	*A cable that connects the 7133 to an SSA attachment or to another device (for example, another 7133).*
Power supply assembly	*An assembly that provides dc power to the 7133.* The 7133 has two power supply assemblies.
Fan assembly	*An assembly that contains a dc cooling fan.* The 7133 has three fan assemblies.
Bypass card	*One of the four cards at the back of a 7133.* The cards are plugged into the backplane assemblies. Each bypass card has two SSA connectors for the external SSA cables, and a switch that automatically connects or disconnects the disk drive module strings internally when external SSA cables are connected or disconnected.
Controller card	*The card that monitors and controls the various functions of the 7133.*
SSA attachment	*The means by which the 7133 is connected to the using system (for example, an SSA adapter card).* The SSA attachment is located in the using system.

The SRNs

SRN	FRU List	Problem
10104	**None**	Description: Format in progress. Action: Wait for the formatting operation to end, then run concurrent diagnostics to ensure that no more problems exist. For information about how to run concurrent diagnostics, see Concurrent Diagnostics in the "Additional Information" appendix (in this book) for your using system.
10112	**None**	Description: Format degraded. A Format operation has been ended before it has completed. Action: Use the Format service aid to format the disk drive module.
1022F	**Disk-drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: Critical over-temperature has been detected. Action: A disk drive module has reported that the temperature is too high. • If the ambient temperature is too high, take actions to decrease it. • If the ambient temperature is within specification, exchange the FRU for a new FRU.
1XXXX	**Disk-drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: Disk drive module error. Action: Exchange the FRU for a new FRU (see "Physical Location of a Device" on page 59). **Note:** In this SRN, an X represents a digit 0 through F.
20PAA	**Disk-drive module (45%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150). **SSA attachment (45%)** (using-system *Installation and Service Guide*). **External SSA cables, optical extenders, or main fibre optic cables (6%)**. **Frame assembly (2%)** ("Frame Assembly" on page 208). **Bypass card (2%)** ("Bypass (SNBC) Cards" on page 201).	Description: An open SSA loop has been detected. Action: Run a link verification, or physical view, service aid to isolate the failure (see the user or maintenance information for your using-system SSA attachment). If the SSA service aids are not available: • When the failing device is in a 7133 Model D40 or Model T40, go to step 12 on page 90 in MAP 2010: 7133 Models D40 and T40 – START. • When the failing device is not in a 7133 Model D40 or Model T40, go to the service information for that device.

SRN	FRU List	Problem
21PAA to 29PAA	**Disk-drive module (45%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150). **SSA attachment (45%)** (using-system *Installation and Service Guide*). **External SSA cables, optical extenders, or main fibre optic cables (6%)**. **Frame assembly (2%)** ("Frame Assembly" on page 208). **Bypass card (2%)** ("Bypass (SNBC) Cards" on page 201).	Description: An SSA 'Threshold exceeded' link error has been detected. Action: Go to the Intermittent Link Error MAP in the user or maintenance information for your using-system SSA attachment.
2A002	**Disk-drive module (50%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150). **SSA attachment (50%)** (using-system *Installation and Service Guide*).	Description: Async code 02 has been received. Probably, a software error has occurred. Action: Go to Software and Microcode Errors in the "Additional Information" appendix (in this book) for your using system before exchanging any FRUs.
2A003	**Disk-drive module (50%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150). **SSA attachment (50%)** (using-system *Installation and Service Guide*).	Description: Async code 03 has been received. Probably, a software error has occurred. Action: Go to Software and Microcode Errors in the "Additional Information" appendix (in this book) for your using system before exchanging any FRUs.
2A004	**Disk-drive module (50%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150). **SSA attachment (50%)** (using-system *Installation and Service Guide*).	Description: Async code 04 has been received. Probably, a software error has occurred. Action: Go to Software and Microcode Errors in the "Additional Information" appendix (in this book) for your using system before exchanging any FRUs.
2A005 2A006 2A106	**Power supply assembly (46%)** ("Power Supply Assemblies" on page 162). **Fan assembly (46%)** ("Fan Assemblies" on page 173). **Controller card asm (5%)** ("Controller Card Assembly" on page 199). **Frame assembly (3%)** ("Frame Assembly" on page 208).	Description: Async code 06 has been received. This code indicates that one or more disk drive modules have detected the loss of redundant power or cooling. Action: Go to "MAP 2010: 7133 Models D40 and T40 – START" on page 87 to further isolate the problem.

SRN	FRU List	Problem
2A206	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: A disk drive module has detected that one of its SSA links has failed the POSTs. Action: Use a link verification, or physical view, service aid to determine where the SSA link is broken (see the user or maintenance information for your using-system SSA attachment). Run concurrent diagnostics to the two disk drive modules that are nearest to, and on each side of, the place where the link is broken. The diagnostics show which disk drive module detected the problem. For information about how run concurrent diagnostics, see Concurrent Diagnostics in the "Additional Information" appendix (in this book) for your using system.
2FFFF	**None**	Description: An async code that is not valid has been received. Action: Go to Software and Microcode Errors in the "Additional Information" appendix (in this book) for your using system.
300C0 301C0	**Power supply assembly (46%)** ("Power Supply Assemblies" on page 162). **Fan assembly (46%)** ("Fan Assemblies" on page 173). **Controller card asm (5%)** ("Controller Card Assembly" on page 199). **Frame assembly (3%)** ("Frame Assembly" on page 208).	Description: A health check has reported that one or more disk drive modules have detected the loss of redundant power or cooling. Action: Go to "MAP 2010: 7133 Models D40 and T40 – START" on page 87 to further isolate the problem.
303FE	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: A disk drive module has reported a microcode error. Action: Go to Software and Microcode Errors in the "Additional Information" appendix (in this book) for your using system before exchanging any FRUs.
303FF	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: A SCSI status that is not valid has been received. Action: Go to Software and Microcode Errors in the "Additional Information" appendix (in this book) for your using system before exchanging any FRUs.
31000	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: The disk drive has been reset by the attachment. The disk drive might be going to fail. Action: If the disk drive can still be accessed, the user should create a backup of all the data from this disk drive, then remove the disk drive from the system configuration. Exchange the FRU for a new FRU.

SRN	FRU List	Problem
33PAA to 4252C	**Not applicable**	Description: SRNs in this range are not enclosure (subsystem) SRNs. Action: For SRNs in this range, see the documentation for your SSA attachment.
43PAA	**Disk drive module (90%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150). **SSA attachment (10%)** (using-system *Installation and Service Guide*).	Description: An SSA device on the loop is preventing the completion of the loop configuration. Action: If the SSA service aids are available, run a link verification, or physical view, service aid to determine which device is preventing configuration (see the user or maintenance information for your using-system SSA attachment). The device that is preventing configuration is the device that is beyond the last-configured device on an open SSA loop. If the SSA service aids or functions are not available, note the value of PAA in this SRN, and go to "Physical Location of a Device" on page 59.
44PAA	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: A disk drive module has a 'Failed' status. Action: If the SSA service aids are available, run a link verification, or physical view, service aid to find the failing disk drive module (see the user or maintenance information for your using-system SSA attachment). If no device is listed with a status of "Failed", use the PAA part of the SRN to determine which device is failing. Before you exchange the failing device, run concurrent diagnostics to that device to determine the cause of the problem. For information about how to run concurrent diagnostics, see Concurrent Diagnostics in the "Additional Information" appendix (in this book) for your using system. If the SSA service aids are not available, note the value of PAA in this SRN, and go to "Physical Location of a Device" on page 59. Exchange the failing FRU for a new FRU.
45PAA	**Disk drive module (40%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150). **SSA attachment (40%)** (using-system *Installation and Service Guide*). **External SSA cables, optical extenders, or main fibre optic cables (18%)** **Frame assembly (2%)** ("Frame Assembly" on page 208).	Description: The SSA attachment has detected an open SSA loop. Action: If the SSA service aids are available, run a link verification, or physical view, service aid to determine which part of the loop is failing (see the user or maintenance information for your using-system SSA attachment). If the SSA service aids or functions are not available, note the value of PAA in this SRN, and go to "Physical Location of a Device" on page 59. Then go to "SSA Link Errors" on page 132 to solve the problem.

SRN	FRU List	Problem
46000 to 6FFFF	**Not applicable**	Description: SRNs in this range are not enclosure (subsystem) SRNs. Action: For SRNs in this range, see the documentation for your SSA attachment.
7XXXX	**None**	Description: An SSA disk drive is missing from the expected configuration of the SSA loop. Action: The missing disk drive is not associated with a 7133. Go to the service information for another device that is in the same SSA loop. **Note:** In this SRN, an X represents a digit 0 through F.
80200	**None**	Description: The 7133 cannot be switched on. Action: Go to "MAP 2020: 7133 Models D40 and T40 – Power" on page 95.
80203	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: A disk drive module has its Check light on. Action: Exchange the FRU for a new FRU.
80210	**Controller card asm (100%)** ("Controller Card Assembly" on page 199).	Description: The controller card has failed. Action: Exchange the FRU for a new FRU.
80211	**Operator panel (95%)** ("Operator Panel and Disk Drive Status Light Assemblies, Flexible Circuits, and Front Bezel Assembly" on page 175). **Controller card asm (5%)** ("Controller Card Assembly" on page 199).	Description: The operator panel has failed. Action: Exchange the FRUs for new FRUs.
80215	**None**	Description: The 7133 has an unexpected Check light on. Action: Go to "MAP 2020: 7133 Models D40 and T40 – Power" on page 95.
8022X	**Power supply assembly (95%)** ("Power Supply Assemblies" on page 162). **Controller card asm (3%)** ("Controller Card Assembly" on page 199). **Frame assembly (2%, Model D40; 1%, Model T40)** ("Frame Assembly" on page 208). **Power switch and cable assembly (1%, Model T40 only)** ("Power Switch and Cable Assembly (Model T40)" on page 190).	Description: The power supply assembly in position X has failed. • 80221 means the power supply assembly in position 1. • 80222 means the power supply assembly in position 2. Action: Exchange the FRUs for new FRUs.

SRN	FRU List	Problem
8023X	**Fan assembly (95%)** ("Fan Assemblies" on page 173). **Controller card asm (3%)** ("Controller Card Assembly" on page 199). **Frame assembly (2%)** ("Frame Assembly" on page 208).	Description: The fan assembly in position X has failed. • 80231 means the fan assembly in position 1. • 80232 means the fan assembly in position 2. • 80233 means the fan assembly in position 3. Action: Exchange the FRUs for new FRUs.
8024X	**Bypass card (95%)** ("Bypass (SNBC) Cards" on page 201). **Controller card asm (3%)** ("Controller Card Assembly" on page 199). **Frame assembly (2%)** ("Frame Assembly" on page 208).	Description: Bypass card SSA port X has failed. • 80241 means SSA port 1. • 80242 means SSA port 16. • 80243 means SSA port 4. • 80244 means SSA port 5. • 80245 means SSA port 8. • 80246 means SSA port 9. • 80247 means SSA port 12. • 80248 means SSA port 13. Action: Exchange the FRU for a new FRU.
80251	**None**	Description: Critical Over-Temperature has been detected. Action: Take actions to decrease the ambient temperature. If you are working on a 7133 Model D40, ensure that the requirements for good airflow have been met. For details, see the Notes under "Environment" on page 38. **Note:** If this error causes the internal dc power of the 7133 to switch off (that is, the 7133 enters Standby mode), the internal dc power switches on automatically after the temperature has decreased and has remained more than 5°C below the critical temperature for 15 minutes.
80252	**None**	Description: Over-Temperature Warning level has been exceeded. Action: Take actions to decrease the ambient temperature. If you are working on a 7133 Model D40, ensure that the requirements for good airflow have been met. For details, see the Notes under "Environment" on page 38. **Note:** If the error ID is WARM, the error is not reset until the ambient temperature has fallen at least 2°C below the warning level.
80253	**None**	Description: Critical Under-Temperature has been detected. Action: Take actions to increase the ambient temperature. **Note:** If this error causes the internal dc power of the 7133 to switch off (that is, the 7133 enters Standby mode), the internal dc power switches on automatically after the temperature has increased and has remained more than 5°C above the critical temperature for 15 minutes.

SRN	FRU List	Problem
80254	**None**	Description: Under-Temperature Warning level has been exceeded. Action: Take actions to increase the ambient temperature.
80260	**None**	Description: An empty disk drive module slot has been reported. The slot has been empty for longer than one minute. Action: Use the service functions (see "Service Functions" on page 62) to find the slot that has been reported empty.
80280	**None**	Description: A disk drive module cannot be configured for some unknown reason. Action: Go to "MAP 2010: 7133 Models D40 and T40 – START" on page 87. If no problem is found, go to Software and Microcode Errors in the "Additional Information" appendix (in this book) for your using system.
80290	**Controller card asm (97%)** ("Controller Card Assembly" on page 199). **None (3%)**	Description: A function has failed because access to the 7133 controller is not possible. This problem might be caused by system activity. Action: Check whether you can get access to the disk drives of the 7133: • If you can get access, run the failing function again. If the same SRN is generated, exchange the FRU for a new FRU. • If you cannot get access, solve the problem that prevents access to the disk drives, the run the failing function again.
D0000	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: The using system cannot configure the disk drive module. Action: This is probably a software problem. Try again to configure the disk drive module. If the problem remains, go to Software and Microcode Errors in the "Additional Information" appendix (in this book) for your using system before exchanging the FRU.
D0100	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: Unable to clear a disk drive module reservation. Action: Exchange the FRU for a new FRU.
D0101	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: The disk drive module has been reserved since the diagnostics started. Action: The disk drive module is in use. Release the disk drive module, and run the diagnostics again.

SRN	FRU List	Problem
D0102	**None**	Description: The command line diagnostics have detected that the device is reserved or fenced out. Action: Use the -u flag to break the reservation or fence. **Warning:** If another using system is using this device, unpredictable results might occur if you break the reservation or fence.
D0103	**None**	Description: The diagnostics attempted to break a reservation, but this adapter does not provide support for the function. Action: A different adapter is using the disk drive module. Release the disk drive module, and run the diagnostics again.
D0200	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: The disk drive module timed out while the diagnostics were running. Action: Rerun the diagnostics. If the problem remains, exchange the FRU for a new FRU.
D0300	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: The disk drive module failed the diagnostic test. Action: Exchange the FRU for a new FRU.
D0400	**Disk drive module (100%)** ("Disk Drive Modules and Dummy Disk Drive Modules" on page 150).	Description: The disk drive module is not ready while the diagnostics are running. Action: Rerun the diagnostics. If the problem remains, exchange the FRU for a new FRU.
D0450	**None**	Description: A Format operation is in progress. Action: The Format operation that was started on this disk drive module has not yet finished. A Format operation can take up to 30 minutes to run. Wait for it to finish before you run the diagnostics again. You can observe the progress of the Format operation by running the Format service aid again on this disk drive module.
D0460	**None**	Description: A Format operation has been degraded. Action: The Format operation that was started on this disk drive module did not finish. Possibly, the disk drive module was switched off while the Format operation was running. Run the Format service aid to format this disk drive module.
D4000 to D6PAA	**Not applicable**	Description: SRNs in this range are not enclosure (subsystem) SRNs. Action: For SRNs in this range, see the documentation for your SSA attachment.

SRN	FRU List	Problem
D8000	**Controller card asm (99%)** ("Controller Card Assembly" on page 199). **Frame assembly (1%)** ("Frame Assembly" on page 208).	Description: The diagnostics cannot get access to the controller. Action: Exchange the FRUs for new FRUs.
D8300	**Controller card asm (100%)** ("Controller Card Assembly" on page 199).	Description: The diagnostics have detected a controller failure. Action: Exchange the FRU for a new FRU.
DFFFF	**Controller card asm (100%)** ("Controller Card Assembly" on page 199).	**Note:** The description and action for this SRN are valid only if you have run diagnostics to a 7133 Model D40 or Model T40 enclosure. If this SRN has occurred because you have run diagnostics to some other device, see the service information for that device. Description: A command or parameter that has been sent is not valid. This problem can be caused by the controller, or by an error in the microcode. Action: Go to Software and Microcode Errors in the "Additional Information" appendix (in this book) for your using system before exchanging the FRU.
SSAXX	**None**	Description: Service aid error code. Action: See the user or maintenance information for your using-system SSA attachment for details. **Note:** In this SRN, an X represents a digit 0 through F.

Maintenance Analysis Procedures (MAPs)

Are You Using the Correct Book? *Do not use this book if you are servicing a 7133 Model 010, 020, 500, or 600 SSA Disk Subsystem.* For the correct book, see Related Publications in the "Additional Information" appendix (in this book) for your using system.

These maintenance analysis procedures (MAPs) describe how to analyze a continuous failure that has occurred in a 7133 Model D40 or Model T40 containing one or more disk drive modules. Failing field-replaceable units (FRUs) of the 7133 can be isolated with these MAPs.

How to Use these MAPs

Attention: Unless the using system needs to be switched off for some other reason, do not switch off the using system when servicing the 7133 or an SSA link. Power cables and external SSA cables that connect the 7133 to the using system can be disconnected while that system is running.

- To isolate the FRUs in the failing 7133, do the actions and answer the questions given in these MAPs.
- When instructed to exchange two or more FRUs in sequence:
  1. Exchange the first FRU in the list for a new one.
  2. Verify that the problem is solved. For some problems, verification means running the diagnostic programs (see the using-system service procedures).
  3. If the problem remains:
     a. Reinstall the original FRU.
     b. Exchange the next FRU in the list for a new one.
  4. Repeat steps 2 and 3 until either the problem is solved, or all the related FRUs have been exchanged.
  5. Do the next action indicated by the MAP.
- See "Lights and Controls" on page 5 for locations and descriptions of the lights and switches.

Attention: Disk drive modules are fragile. Handle them with care, and keep them well away from strong magnetic fields.

MAP 2010: 7133 Models D40 and T40 – START

This MAP is the entry point to the MAPs for the 7133 Models D40 and T40. If you are not familiar with these MAPs, read "How to Use these MAPs" on page 86 first.

You might have been sent here because:

- The system problem determination procedures sent you here.
- Action from an SRN list sent you here.
- A problem occurred during the installation of a 7133 or a disk drive module.
- Another MAP sent you here.
- A customer observed a problem that was not detected by the system problem determination procedures.

Attention: Unless the using system needs to be switched off for some other reason, do not switch off the using system when servicing the 7133 or an SSA link. Power cables and external SSA cables that connect the 7133 to the using system can be disconnected while that system is running.

Step 1. (from MAP 2410: 7133 Models D40 and T40 – Repair Verification step 2; and from MAP 2020: 7133 Models D40 and T40 – Power step 4)

Is the 7133 emitting smoke or a smell of burning?

NO   Go to step 2 on page 88.

YES

      a. If the 7133 is switched on, switch it off. (Press and release the power switch.)

      b. At the back of the 7133, unplug the power cables from the power supply assemblies.

      c. Allow the 7133 to cool.

      d. Go to "MAP 2022: 7133 Models D40 and T40 – Power-On" on page 99.

Step 2. (from step 1)

Are you at this MAP because power is not removed completely from the 7133 when the using system is switched off?

NO   Go to step 3.

YES

     a. Check whether the 7133 has a Remote Power On Control feature installed (see "Remote-Power-On Control Unit and Cables" on page 21).

       If the feature *is* installed, go to substep 2b.

       If the feature is *not* installed, the using system has no control over the supply of power to the 7133. Go no further with this MAP.

     b. Ensure that the using-system power-control cables are correctly connected to the remote-power-on control unit.

     c. Ensure that all attached using systems are switched off.

     d. Go to step 6 on page 107 in MAP 2030: 7133 Models D40 and T40 – Remote Power On Control Feature.

Step 3. (from step 2)

Are you at this MAP because the using system has configured some disk drive modules of a 7133 Model D40 or Model T40, but it has configured those modules without any enclosure information?

NO   Go to step 7 on page 90.

YES   Go to step 4.

Step 4. (from step 3)

Is only one disk drive module affected?

NO   Go to step 5 on page 89.

YES   In the sequence shown, exchange the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

     a. Disk drive module (see "Disk Drive Modules and Dummy Disk Drive Modules" on page 150).

     b. Controller card assembly (see "Controller Card Assembly" on page 199).

     c. Frame assembly (see "Frame Assembly" on page 208).

Step 5. (from step 4)

Are the four disk drive modules of a particular internal string affected?
(For information about internal strings, see "Internal Connections (Model D40)" on page 28 or "Internal Connections (Model T40)" on page 30.)

NO

    a. Exchange the controller card assembly for a new one (see "Controller Card Assembly" on page 199).

    b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

    c. If the problem remains, go to Software and Microcode Errors in the "Additional Information" appendix (in this book) for your using system.

YES

    a. Ensure that the using system is not using any of the four disk drive modules.

    b. Unplug each disk drive module by opening its handle (see step 9 on page 151 through step 15 on page 153). You do not need to remove the modules completely.

    c. Try to reconfigure each disk drive module in turn, by plugging in one module at a time.

    d. Go to step 6.

Step 6. (from step 5)

Does only one disk drive module fail to configure correctly?

NO In the sequence shown, exchange the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

    a. Controller card assembly (see "Controller Card Assembly" on page 199).

    b. Frame assembly (see "Frame Assembly" on page 208).

YES

    a. Exchange the disk drive module for a new one (see "Disk Drive Modules and Dummy Disk Drive Modules" on page 150).

    b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 7. (from step 3)

Have you been sent to this MAP from a service aid or service function?

NO   Go to step 8.

YES   Go to MAP Extension in the "Additional Information" appendix (in this book) for your using system. If the MAP extension is not applicable to your using system, go to step 8.

Step 8. (from step 7, and MAP Extension step 4 on page 273)

Have you been sent to this MAP from an SRN?

NO   Go to step 9.

YES   Go to step 12.

Step 9. (from step 8)

Have the system diagnostics or problem determination procedures given you an SRN for the 7133?

NO

- If the system diagnostics are available, go to step 10.
- If the system diagnostics are not available, but the stand-alone diagnostics are available:
  a. Run the stand-alone diagnostics.
  b. Go to step 11.
- If neither the system diagnostics nor the stand-alone diagnostics are available, go to step 12.

YES   Go to "Service Request Numbers (SRNs)" on page 75.

Step 10. (from step 9)

a. Run the concurrent diagnostics. For information about how to run concurrent diagnostics, see Concurrent Diagnostics in the "Additional Information" appendix (in this book) for your using system.

b. When the concurrent diagnostics have completed, go to step 11.

Step 11. (from steps 9 and 10, MAP 2022: 7133 Models D40 and T40 – Power-On step 12 on page 102, and MAP Extension step 4 on page 273)

Did the diagnostics give you an SRN for the 7133?

NO   Go to step 12.

YES   Go to "Service Request Numbers (SRNs)" on page 75.

Step 12. (from steps 8, 9, 11, 17, and 18)

Does any 7133 Model D40 or Model T40 have its Check light on?

NO   Go to step 13 on page 91.

YES   Go to step 19 on page 92.

Step 13. (from step 12)

Does any 7133 Model D40 or Model T40 have its Power light off or flashing?

NO   Go to step 14.

YES

- If the Power light is off, go to "MAP 2020: 7133 Models D40 and T40 – Power" on page 95.
- If the Power light is flashing, go to step 16 on page 92.

Step 14. (from step 13)

Do you have SRN 300C0 or 2A006?

NO   Go to step 15.

YES   Use the SSA service aids to check whether any disk drive module has detected the loss of redundant power or cooling (see Displaying Link and Power Problems in the "Additional Information" appendix (in this book) for your using system).

- If any disk drive module is reporting the loss of redundant power or cooling:

  a. Exchange that disk drive module for a new one (see "Disk Drive Modules and Dummy Disk Drive Modules" on page 150).

  b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

- If no disk drive module is reporting the loss of redundant power or cooling, the problem might have been already solved, or it is intermittent. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 15. (from step 14)

Do you have SRN 301C0 or 2A106?

NO   Go to the SSA Link MAP in the user or maintenance information for your using-system SSA attachment.

YES

- If the system error log contains any 80XXX SRNs, go to "Service Request Numbers (SRNs)" on page 75, and follow the instructions given for those SRNs.
- If the problem remains, or if the system error log does not contain any 80XXX SRNs do either or both of the following actions, as appropriate:

  – If the loop contains SSA enclosures that are not 7133 Models D40 or T40, those 7133s might be the cause of this problem. Follow the procedure given for **"YES"** in step 14.

  – Exchange the controller card assembly for a new one (see "Controller Card Assembly" on page 199), then go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 16. (from step 13)

Are you servicing a 7133 Model T40 (deskside unit)?

NO   Go to step 17.

YES   Go to step 18.

Step 17. (from step 16)

The 7133 is in Standby mode. Press and release the 7133 Power switch.

Does the 7133 Power light come on, and stay on continuously?

NO   Go to step 18.

YES   Go to step 12 on page 90.

Step 18. (from step 13)

Does the 7133 have a Remote Power On Control feature?

NO   Switch on the 7133, and return to step 12 on page 90.

YES   Go to "MAP 2030: 7133 Models D40 and T40 – Remote Power On Control Feature" on page 103.

Step 19. (from step 12)

Observe the ID display of the 7133 whose Check light is on.

Does the display show the word "POST" for longer than 10 seconds?

NO   Go to step 20 on page 93.

YES

    a. Exchange the controller card assembly for a new one (see "Controller Card Assembly" on page 199).

    b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 20. (from step 19)

Is the display showing the 7133 ID and an error ID alternately?

NO   Go to step 21 on page 94.

YES   In Table 6, find the error ID that is being displayed, and note its related SRN. Then, go to the table in "Service Request Numbers (SRNs)" on page 75 and do the actions for that SRN.

Table 6. Error IDs and Their Related SRNs

Error ID	See SRN/Information
BP1 BP16	80241 80242
BP4 BP5	80243 80244
BP8 BP9	80245 80246
BP12 BP13	80247 80248
CODE	80210
COLD	80253
COOL	80254
CTRL	80210
FAN1	80231
FAN2	80232
FAN3	80233
HOT	80251
OPNL	80211
POST-FAIL-XXXX Where XXXX= XROM WDOG IROM IRAM LED! I2C RTC1 RTC2 TIME UART FAN XRAM	80210
PSU1	80221
PSU2	80222
SLOT	80260
WARM	80252

Note: If the COLD or HOT error ID remains for four minutes, the internal dc power switches off (that is, the 7133 enters Standby mode).

If the error ID is COLD, the internal dc power switches on automatically after the temperature has increased and has remained more than 5°C above the critical temperature for 15 minutes.

If the error ID is WARM, the error is not reset until the ambient temperature has fallen at least 2°C below the warning level.

If the error ID is HOT, the internal dc power switches on automatically after the temperature has decreased and has remained more than 5°C below the critical temperature for 15 minutes.

Step 21. (from step 20)

Is the controller card Check light on?

NO Go to step 22.

YES

a. Exchange the controller card assembly for a new one (see "Controller Card Assembly" on page 199).

b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 22. (from step 21)

Does any disk drive module have its Check light on?

NO

a. Exchange the controller card assembly for a new one (see "Controller Card Assembly" on page 199).

b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

YES Check whether the disk drive module is in Service mode. (Service mode might have been set from another using system.)

If the disk drive module is in Service mode, reset it when possible.

If the disk drive module is *not* in Service mode:

a. Exchange the disk drive module for a new one (see "Disk Drive Modules and Dummy Disk Drive Modules" on page 150).

b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

MAP 2020: 7133 Models D40 and T40 – Power

This MAP helps you to isolate FRUs that are causing a power problem on a 7133 Model D40 or Model T40.

Attention: Unless the using system needs to be switched off for some other reason, do not switch off the using system when servicing the 7133 or an SSA link. Power cables and external SSA cables that connect the 7133 to the using system can be disconnected while that system is running.

You are here because of one or more of the following:
- The 7133 Power light is off.
- An SRN has sent you here.

Step 1. (from step 10; and from MAP 2010: 7133 Models D40 and T40 – START step 13)

Is the 7133 Power light On?

NO   Go to step 7 on page 96.

YES   Go to step 2.

Step 2. (from step 1)

Does either power supply assembly have its PWR light on?

NO   Check the mainline power source.

YES   Go to step 3.

Step 3. (from steps 2 and 8)

Is the CHK/PWR-GOOD light of either power supply assembly showing amber?

NO   Go to step 6 on page 96.

YES

a. Switch off the PWR/FAULT RESET switch of power supply assembly whose CHK/PWR-GOOD light is showing amber, then switch it on (see "Lights and Controls" on page 5).

b. Go to step 4.

Step 4. (from step 3)

Is the CHK/PWR-GOOD light showing green?

NO

a. Switch off the PWR/FAULT RESET switch of the other power supply assembly, then switch it on (see "Lights and Controls" on page 5).

b. Go to step 5 on page 96.

YES   Go to "MAP 2010: 7133 Models D40 and T40 – START" on page 87.

Step 5. (from step 4)

Is the CHK/PWR-GOOD light of this power supply assembly showing green?

NO   Go to "MAP 2022: 7133 Models D40 and T40 – Power-On" on page 99.

YES

    a. Exchange, for a new one, the power supply assembly whose CHK/PWR-GOOD light was showing amber in step 3 (see "Power Supply Assemblies" on page 162).

    b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 6. (from step 3)

Are the CHK/PWR-GOOD lights of both power supply assemblies either green or off?

NO

    a. Exchange, for a new one, the power supply assembly whose CHK/PWR-GOOD light is neither green nor off (see "Power Supply Assemblies" on page 162).

    b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

YES   In the sequence shown, exchange the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

    a. Controller card assembly (see "Controller Card Assembly" on page 199).

    b. Operator panel (see "Operator Panel and Disk Drive Status Light Assemblies, Flexible Circuits, and Front Bezel Assembly" on page 175).

    c. Frame assembly (see "Frame Assembly" on page 208).

Step 7. (from step 1)

Are any operator panel lights or the ID display on?

NO   Go to step 8 on page 97.

YES   The 7133 PWR light has failed.

    a. Exchange the operator panel assembly for a new one (see "Operator Panel and Disk Drive Status Light Assemblies, Flexible Circuits, and Front Bezel Assembly" on page 175).

    b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 8. (from step 7)

Does each power supply assembly have its PWR light on?

NO   Go to step 9.

YES   Go to step 3 on page 95.

     a. Exchange the operator panel assembly for a new one (see "Operator Panel and Disk Drive Status Light Assemblies, Flexible Circuits, and Front Bezel Assembly" on page 175).

     b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 9. (from step 8)

Are you servicing a 7133 Model T40 (deskside unit)?

NO   Go to step 11 on page 98.

YES

     a. Press the 7133 Power switch.

     b. Go to step 10.

Step 10. (from step 9)

Does each power supply assembly have its PWR light on?

NO   Go to step 11 on page 98.

YES   Go to step 1 on page 95.

Step 11. (from steps 9 and 10)

Check the electrical power source.

Is the electrical power source providing power correctly?

NO   Repair the electrical power source if you are qualified to do so. Otherwise, request assistance from a qualified electrician.

YES

- If you are servicing a 7133 Model D40:

  a. Exchange the 7133 power cables for new cables.

  b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

- If you are servicing a 7133 Model T40, exchange, in the sequence shown, the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

  a. Power cables

  b. Power switch and cable assembly (see "Power Switch and Cable Assembly (Model T40)" on page 190).

MAP 2022: 7133 Models D40 and T40 – Power-On

This MAP helps you to isolate FRUs that are causing a power problem on a 7133 Model D40 or Model T40.

Attention: Unless the using system needs to be switched off for some other reason, do not switch off the using system when servicing the 7133 or an SSA link. Power cables and external SSA cables that connect the 7133 to the using system can be disconnected while that system is running.

Step 1. (from MAP 2010: 7133 Models D40 and T40 – START step 1; and from MAP 2020: 7133 Models D40 and T40 – Power step 5)

a. Remove all power from the 7133 (see "All Power" on page 145).

   Note: Ensure that you switch off both power supply assemblies.

b. Remove both power supply assemblies (see "Power Supply Assemblies" on page 162).

c. Remove the three fan assemblies (see "Fan Assemblies" on page 173).

d. Disconnect all the disk drive modules from the backplanes. To do this, open the handle on each disk drive module (see "Disk Drive Modules and Dummy Disk Drive Modules" on page 150).

e. Remove the controller card assembly (see"Controller Card Assembly" on page 199).

f. Remove the four bypass cards (see "Bypass (SNBC) Cards" on page 201).

g. Go to step 2 on page 100.

Step   2.   (from step 1)

    a.   Reinstall one of the power supply assemblies.

    b.   Connect a power cable to the power supply assembly.

    c.   If you are servicing a Model T40, press and release the power switch.

    d.   Switch on the power supply assembly. The 7133 switches on automatically.

> **Note:** Unless a procedure needs you to switch off the 7133, leave the 7133 switched on for the remainder of this MAP.

Does the 7133 emit smoke or a smell of burning?

NO Go to step 3.

YES

    a.   In the sequence shown, exchange the following FRUs for new FRUs:

        1)   The power supply assembly that you have just reinstalled (see "Power Supply Assemblies" on page 162).

        2)   Frame assembly (see "Frame Assembly" on page 208).

    b.   Go to step 3.

Step   3.   (from step 2)

    a.   Reinstall the other power supply assembly.

    b.   Connect a power cable to the power supply assembly.

    c.   Switch on the power supply assembly.

> **Note:** Unless a procedure needs you to switch off the 7133, leave the 7133 switched on for the remainder of this MAP.

Does the 7133 emit smoke or a smell of burning?

NO Go to step 4 on page 101.

YES

    a.   In the sequence shown, exchange the following FRUs for new FRUs:

        1)   The power supply assembly that you have just reinstalled (see "Power Supply Assemblies" on page 162).

        2)   Frame assembly (see "Frame Assembly" on page 208).

    b.   Go to step 4 on page 101.

Step 4. (from steps 3 and 5)

Reinstall a fan assembly.

Does the 7133 emit smoke or a smell of burning?

NO Go to step 5.

YES

  a. Exchange, for a new one, the fan assembly that you have just reinstalled.
  b. Go to step 5.

Step 5. (from step 4)

Have you reinstalled all the fan assemblies?

NO Return to step 4.

YES Go to step 6.

Step 6. (from step 5)

Reinstall the controller card assembly.

Does the 7133 emit smoke or a smell of burning?

NO Go to step 7.

YES

  a. Exchange controller card assembly for a new one.
  b. Go to step 7.

Step 7. (from steps 6 and 8)

Reinstall one of the bypass cards.

Does the 7133 emit smoke or a smell of burning?

NO Go to step 8.

YES

  a. Exchange, for a new one, the bypass card that you have just reinstalled.
  b. Go to step 8.

Step 8. (from step 7)

Have you reinstalled all the bypass cards?

NO Return to step 7.

YES Go to step 9 on page 102.

Step 9. (from step 8)

Reconnect a disk drive module by closing its handle (see "Installing a Module" on page 156).

Does the 7133 emit smoke or a smell of burning?

NO   Go to step 10.

YES

    a. Exchange, for a new one, the disk drive module that you have just reconnected.

    b. Go to step 10.

Step 10. (from steps 9 and 11)

Reconnect the next disk drive module.

Does the 7133 emit smoke or a smell of burning?

NO   Go to step 11.

YES

    a. Exchange, for a new one, the disk drive module that you have just reconnected.

    b. Go to step 11.

Step 11. (from step 10)

Have you reconnected all the disk drive modules?

NO   Return to step 10.

YES   Go to step 12.

Step 12. (from step 11)

Have you solved the problem?

NO   Remove all power from the 7133, and call for assistance.

YES   Go to step 11 on page 90 of MAP 2010: 7133 Models D40 and T40 – START.

MAP 2030: 7133 Models D40 and T40 – Remote Power On Control Feature

This MAP helps you to isolate FRUs that are causing a power problem when a Remote Power On Control feature is installed on a 7133 Model D40 or Model T40. See the using-system *Installation and Service Guide*, or equivalent, for information about how the using-system power-control cables are connected.

Attention: Unless the using system needs to be switched off for some other reason, do not switch off the using system when servicing the 7133 or an SSA link. Power cables and external SSA cables that connect the 7133 to the using system can be disconnected while that system is running.

Step 1. (from MAP 2010: 7133 Models D40 and T40 – START step 18)

   Is the power switched on at the using system?

   NO The power supply assemblies receive no power-on signal if the using-system power-control cables are installed and the using-system power is switched off.

   a. Switch on the using-system power.

   b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

   YES Go to step 2.

Step 2. (from step 1)

   Is the remote-power-on control unit switch set to | (on)?

   NO

   a. Set the remote-power-on control unit switch to **|** (on).

   b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

   YES Go to step 3 on page 104.

Step 3. (from step 2)

    a. Disconnect both MAIN using-system power-control cables from connectors J3 and J4 of the remote-power-on control unit.

    b. Observe the power supply assemblies in the 7133.

Does at least one CHK/PWR-GOOD light show green?

NO

    a. Reconnect the MAIN using-system power-control cables to the remote-power-on control unit.

    b. Go to step 4 on page 105.

YES The remote-power-on control unit has not received a signal from the using system.

    a. Reconnect the MAIN using-system power-control cables to the remote-power-on control unit.

    b. Go to step 5 on page 106.

Step 4. (from step 3)

a. Identify the short 7133 power-control cable that connects the power supply assembly in position 1 to the remote-power-on control unit. Disconnect that cable from the power supply assembly.

b. Observe the power supply assemblies.

Does at least one CHK/PWR-GOOD light show green?

NO

a. Reconnect the short 7133 power-control cable to power-control connector of the power supply assembly in position 1.

b. In the sequence shown, exchange the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

1) The controller card assembly (see "Controller Card Assembly" on page 199)

2) The power supply assembly that is in position 1 (see "Power Supply Assemblies" on page 162)

3) Frame assembly (see "Frame Assembly" on page 208)

YES In the sequence shown, exchange the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

a. Remote-power-on control unit (see "Remote-Power-On Control Unit" on page 204)

b. Short 7133 power-control cable that connects the power supply assembly in position 1 to the remote-power-on control unit

Step 5. (from step 3)

Observe the remote-power-on control unit.

Are the MAIN connectors (J3 and J4) and the AUX connectors (J1 and J2) all connected to a using system?

NO

  a. In the sequence shown, exchange the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

   1) Remote-power-on control unit (see "Remote-Power-On Control Unit" on page 204).

   2) MAIN using-system power-control cables.

  b. If the problem remains, the power control signal is not being generated by the using system. Refer to the using-system *Installation and Service Guide*, or equivalent, to solve the problem.

YES

  a. If both using systems are powered on, exchange, in the sequence shown, the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

   1) Remote-power-on control unit (see "Remote-Power-On Control Unit" on page 204).

   2) MAIN using-system power-control cables.

  b. If only one using system is powered on, exchange, in the sequence shown, the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

   1) Remote-power-on control unit (see "Remote-Power-On Control Unit" on page 204).

   2) The power-control cables that are connected to the using system that is powered on.

  c. If the problem remains, the power control signal is not being generated by the using system. Refer to the using-system *Installation and Service Guide*, or equivalent, to solve the problem.

Step 6. (from MAP 2010: 7133 Models D40 and T40 – START step 2 on page 88)

You have arrived at this step because the MAIN and AUX using systems are switched off, but power is still present at the 7133; that is, the 7133 Power light is on continuously.

Does the CHK/PWR-GOOD light of each power supply assembly show green?

NO   In the sequence shown, exchange the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

        a. The power supply assembly whose CHK/PWR-GOOD light shows green (see "Power Supply Assemblies" on page 162)

        b. Controller card assembly (see "Controller Card Assembly" on page 199)

        c. Frame assembly (see "Frame Assembly" on page 208)

YES   Go to step 7.

Step 7. (from step 6)

    a. Set the remote-power-on control unit switch to O (off).

    b. Observe the power supply assemblies.

Does the CHK/PWR-GOOD light of each power supply assembly show green?

NO   In the sequence shown, exchange the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

        a. Remote-power-on control unit (see "Remote-Power-On Control Unit" on page 204)

        b. Short 7133 power-control cable that connects the power supply assembly in position 1 to the remote-power-on control unit.

        c. Controller card assembly (see "Controller Card Assembly" on page 199)

        d. The power supply assembly whose CHK/PWR-GOOD light shows green

        e. Frame assembly (see "Frame Assembly" on page 208)

YES   Go to step 8 on page 108.

Step 8. (from step 7)

    a. Set the remote-power-on control unit switch to **|** (on).

    b. Remove the using-system power-control cables (if present) from the AUX connectors (J1 and J2) of the remote-power-on control unit.

    c. Observe the power supply assemblies.

Does the CHK/PWR-GOOD light of each power supply assembly show green?

NO

    a. A power-on signal is being detected on the power-control cables that are connected to the AUX connectors of the remote-power-on control unit. Refer to the using-system *Installation and Service Guide*, or equivalent, to solve the problem.

    b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

YES   Go to step 9.

Step 9. (from step 8)

    a. Reconnect the AUX power-control cables if previously removed.

    b. Disconnect the far ends of both MAIN power-control cables from the device or power distribution unit to which they are connected.

    c. Observe the power supply assemblies.

Does the CHK/PWR-GOOD light of each power supply assembly show green?

NO

    a. A power-on signal is being detected on the power-control cables that are connected to the MAIN connectors of the remote-power-on control unit. Refer to the using-system *Installation and Service Guide*, or equivalent, to solve the problem.

    b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

YES   In the sequence shown, exchange the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

    a. Remote-power-on control unit (see "Remote-Power-On Control Unit" on page 204).

    b. MAIN power-control cables.

MAP 2330: 7133 Models D40 and T40 – Optical Extender

This maintenance analysis procedure (MAP) describes how to analyze a failure that has occurred in the optical link.

Diagnostic aid is provided by two lights on each optical extender: a Power light **1** and a Receive light **2** . During normal operations, both lights of each optical extender are on (see Figure 43).
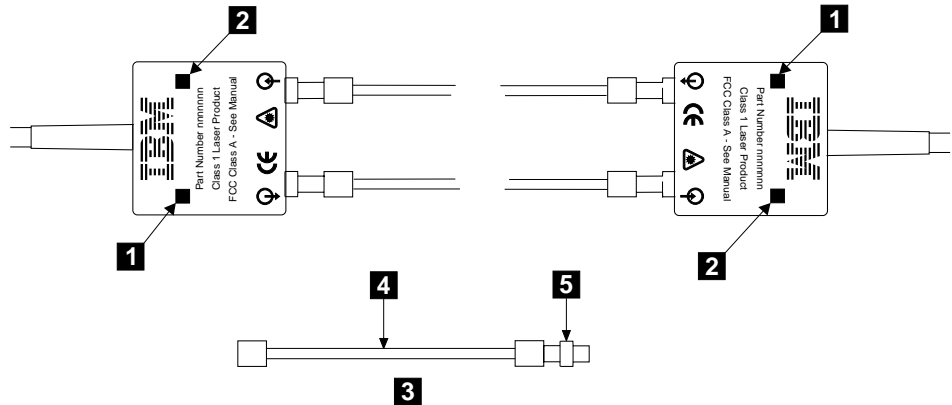
Figure 43. Optical Extender with a Wrap Cable and Adapter Assembly

A wrap cable and adapter assembly **3** is provided with each optical extender. This assembly consists of a fibre optic wrap cable **4** and a fibre optic wrap adapter **5** . The two parts of the assembly are used during diagnostic procedures. The wrap cable connects the connectors of the optical extender to each other; the wrap adapter connects the two main fibre optic cables to each other.

Important Notes:

1. Ensure that each fibre optic cable is connected, via multi-mode conditioners (if present), between the Receive connector of one optical extender and the Transmit connector of the other optical extender.

   Note: The connectors are identified by symbols. An arrow entering a circle identifies the Receive connector. An arrow leaving a circle identifies the Transmit connector. (See also Figure 9 on page 22.)

2. Before connecting fibre optic cables and devices, ensure that the end faces of the cables are clean. If necessary, use a small cotton pad to apply a fibre-cleaning fluid, such as IPA/D-1 Water Mix 106-17F, to the end faces.

3. When the wrap cable and adapter assembly is not in use, the ends of the wrap cable are protected as follows:

   - If the wrap cable is 400 mm (15 in.) long, each of its ends is connected to the wrap adapter to make a closed loop.

- If the wrap cable is 150 mm (6 in.) long, one end of the cable is connected to the wrap adapter, and protective covers are placed over each end of the complete wrap cable and adapter assembly.

  The wrap cable and adapter assembly must be kept in its plastic bag in a safe place that is as close to the optical extender as possible. At least one wrap cable and adapter assembly must be kept at each end of the link.

4. For multi-mode operations, ensure that the correct type of multi-mode conditioner has been installed (see "Specifications for Fibre Optic Cables and Connectors" on page 26).

Step 1.

You are here because the optical link might not be working correctly.

Ensure that:

- The optical extender at each end of the optical link is correctly plugged in.
- The main fibre optic cables are correctly connected to the optical extenders.
- The using system and the 7133 (or any other device into which optical extenders are plugged) are switched on.
- If the fibre optic link is to be used for multi-mode operation, the correct type of multi-mode conditioner has been installed at each end of the link (see "Specifications for Fibre Optic Cables and Connectors" on page 26).

Does the problem remain?

NO   Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

YES   Go to step 2.

Step 2.   (from steps 1, 14, and 19)

If you are at this step for the first time, observe the lights on either of the two optical extenders of the link.

If you have come to this step from any step in this MAP other than step 1, observe the lights on the optical extender at the other end of the link.

Is the Power light off?

NO   Go to step 3.

YES   Go to step 5 on page 113.

Step 3.   (from step 2)

Is the Receive light off?

NO   Go to step 13 on page 125.

YES   Go to step 4 on page 112.

Step 4.   (from step 3)

Is the Receive light off at each end of the optical link?

NO   Go to step 6 on page 115.

YES   Check whether the fibre optic cables are crossed over; that is, one
cable is connected to a Receive connector at each end, and the other
cable is connected to a Transmit connector at each end.

If the cables are *not* crossed over, go to step 6 on page 115.

If the cables are crossed over:

a. Reconnect the cables correctly.

b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair
Verification" on page 131 to verify the repair.

Step 5. (from step 2)

   a. Unplug from the 7133, SSA attachment, or other device, the optical
      extender whose Power light is off.

   b. Refer to Figure 44.
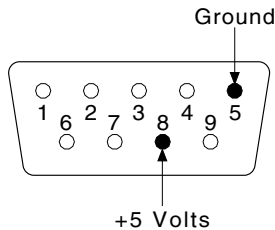
Figure 44. SSA Connector Pins

   c. At the connector from which you have unplugged the optical extender,
      check the voltage between pins 5 and 8; it should be +5 volts.

   Is the voltage correct?

   NO

   - If the connector that you have just checked is on a 7133,
     exchange, in the sequence shown, the following FRUs for new
     FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410:
     7133 Models D40 and T40 – Repair Verification" on page 131 to
     verify the repair.

     a. The first disk drive module in the string whose connector you
        have just checked (see "Disk Drive Modules and Dummy Disk
        Drive Modules" on page 150.

        For information about disk drive module strings, see "Internal
        Connections (Model D40)" on page 28 or "Internal Connections
        (Model T40)" on page 30.

     b. If present, the dummy disk drive modules that are between the
        connector and the first disk drive module of the string (see
        "Disk Drive Modules and Dummy Disk Drive Modules" on
        page 150).

     c. The bypass card containing the connector that you have just
        checked (see "Bypass (SNBC) Cards" on page 201).

   - If the connector that you have just checked is on an SSA
     attachment:

     a. Exchange that SSA attachment for a new one (see the
        Installation and Service Guide, or equivalent, for the using
        system).

     b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair
        Verification" on page 131 to verify the repair.

   - If the connector that you have just checked is on some other
     device:

a. Exchange, for new FRUs, the appropriate FRUs of the device (see the service information for the device).

b. Check the power source of the device.

c. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

YES

a. Exchange the optical extender for a new one.

b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

c. If the problem remains, continue with this step.

- If the new optical extender that you have just installed is plugged into a 7133, exchange, in the sequence shown, the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

  1) The first disk drive module in the string whose connector you have just checked (see "Disk Drive Modules and Dummy Disk Drive Modules" on page 150).

     For information about disk drive module strings, see "Internal Connections (Model D40)" on page 28 or "Internal Connections (Model T40)" on page 30.

  2) If present, the dummy disk drive modules that are between the connector and the first disk drive module of the string (see "Disk Drive Modules and Dummy Disk Drive Modules" on page 150).

  3) The bypass card into which the new optical extender is plugged (see "Bypass (SNBC) Cards" on page 201).

- If the new optical extender that you have just installed is plugged into an SSA attachment:

  1) Exchange that attachment for a new one (see the *Installation and Service Guide*, or equivalent, for the using system).

  2) Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

- If the new optical extender that you have just installed is plugged into some other device:

  1) Exchange, for new FRUs, the appropriate FRUs of the device (see the service information for the device).

  2) Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 6.   (from step 4)

  a. In the next step, you are going to disconnect the fibre optic cables. Before
      you do so, note the identifications of the fibre optic cables to ensure that
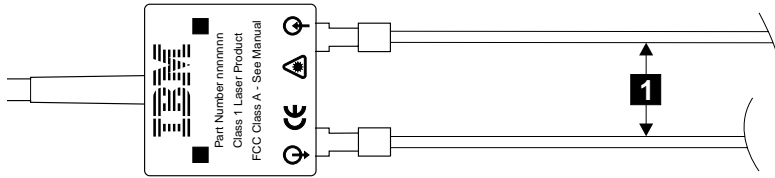   you reconnect them correctly later.

  b. Refer to Figure 45.
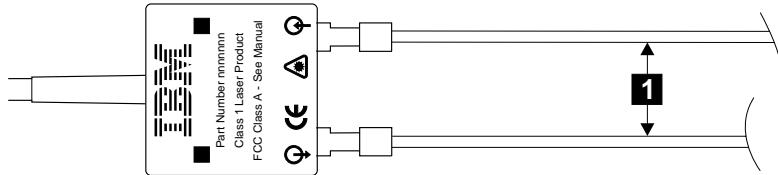
Figure 45. Optical Extender and Fibre Optic Cables

  c. Disconnect the fibre optic cables **1** from the optical extender.

  d. Find the wrap cable and adapter assembly that is provided with the optical
      extender.

  e. Remove the wrap cable and adapter assembly from its plastic bag.

  f. If the wrap cable and adapter assembly has a protective cover at each end,
   remove those covers.

  g. Refer to Figure 46.
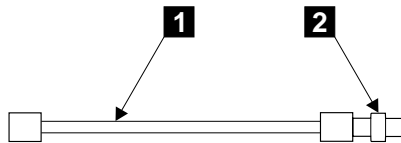
Figure 46. Wrap Cable and Wrap Adapter

  h. Disconnect the wrap cable **1** from the wrap adapter **2** .
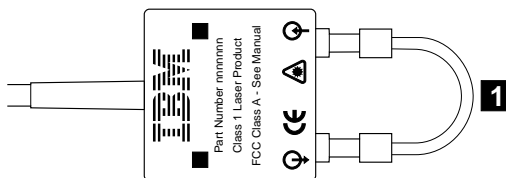
i. Refer to Figure 47.
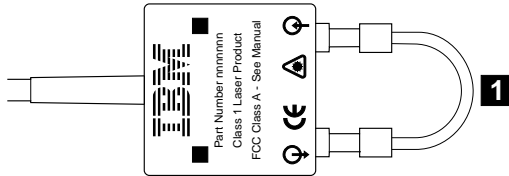
Figure 47. Wrapped Optical Extender

    j. Connect the wrap cable **1** to the connectors of the optical extender.

Does the Receive light of the optical extender come on?

NO

    a. Remove the wrap cable from the optical extender, and do whichever of the two following actions is appropriate:

- If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.
- If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

    b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

    c. Exchange the optical extender for a new one.

    d. Observing the identifications of the fibre optic cables, connect the cables to the new optical extender.

    e. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

        Note: If the problem remains, find another wrap cable and adapter assembly, and repeat this step. The original wrap cable might have failed.

YES

    a. Remove the wrap cable from the optical extender, and do whichever of the two following actions is appropriate:

- If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.

- If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

    b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

    c. Observing the identifications of the fibre optic cables, reconnect the cables to the optical extender.

    d. Go to step 7.

Step 7. (from step 6)

Is a multi-mode conditioner present in the optical link?

NO   Go to step 9.

YES

    a. In the next step, you are going to disconnect the main fibre optic cables. Before you do so, note the identifications of the main fibre optic cables to ensure that you reconnect them correctly later.
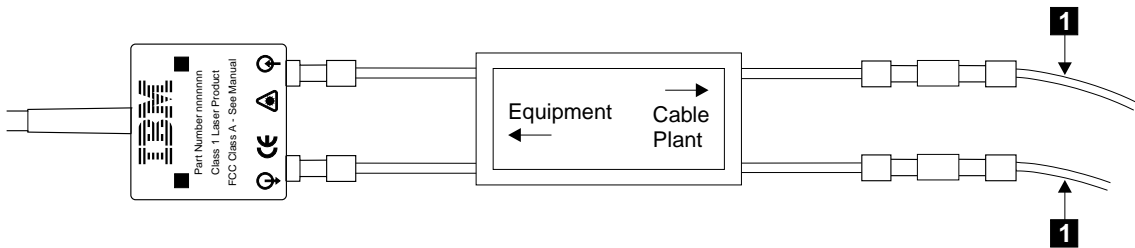
    b. Refer to Figure 48.
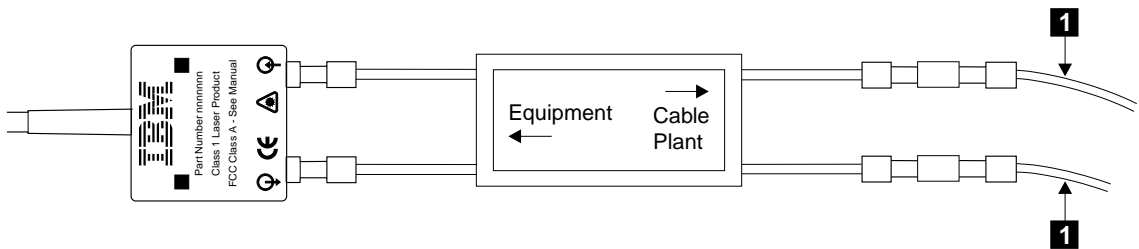
Figure 48. Multi-Mode Conditioner and Main Fibre Optic Cables

    c. Disconnect the main fibre optic cables **1** from the multi-mode conditioner.

    d. Find the wrap cable and adapter assembly that is provided with the optical extender.

    e. Remove the wrap cable and adapter assembly from its plastic bag.

    f. If the wrap cable and adapter assembly has a protective cover at each end, remove those covers.
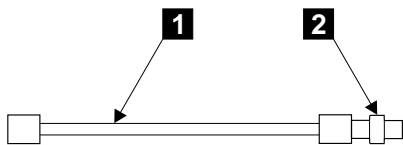
g. Refer to Figure 49.
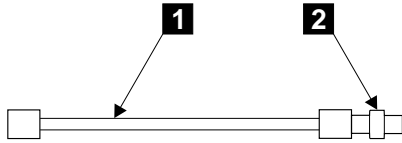
Figure 49. Wrap Cable and Wrap Adapter

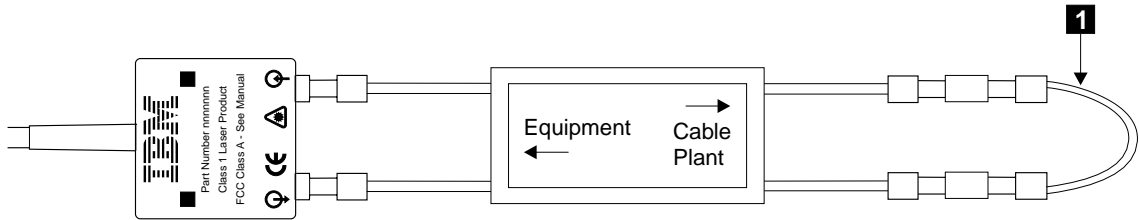h. Disconnect the wrap cable **1** from the wrap adapter **2** .

i. Refer to Figure 50.
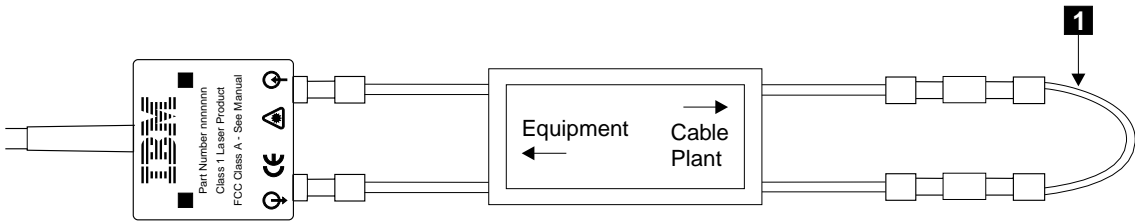
Figure 50. Wrapped Multi-Mode Conditioner

j. Connect the wrap cable **1** to the connectors of the multi-mode conditioner.

k. Go to step 8.

Step 8. (from step 7)

Does the Receive light of the optical extender come on?

NO

a. Remove the wrap cable from the multi-mode conditioner, and do whichever of the two following actions is appropriate:

• If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.

• If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

c. Exchange the multi-mode conditioner for a new one.

d. Observing the identifications of the fibre optic cables, connect the cables to the new multi-mode conditioner.

e. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

> **Note:** If the problem remains, find another wrap cable and adapter assembly, and repeat this step. The original wrap cable might have failed.

YES

a. Remove the wrap cable from the multi-mode conditioner, and do whichever of the two following actions is appropriate:

- If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.
- If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

c. Observing the identifications of the main fibre optic cables, reconnect those cables to the multi-mode conditioner.

d. Go to step 9.

Step 9. (from steps 7 and 8)

    a. Find the optical extender at the other end of the link.

    b. In the next step, you are going to disconnect the fibre optic cables. Before you do so, note the identifications of the fibre optic cables to ensure that you reconnect them correctly later.

    c. Refer to Figure 51.

Figure 51. Optical Extender and Fibre Optic Cables

    d. Disconnect the fibre optic cables **1** from the optical extender.

    e. Find the wrap cable and adapter assembly that is provided with the optical extender.

    f. Remove the wrap cable and adapter assembly from its plastic bag.

    g. If the wrap cable and adapter assembly has a protective cover at each end, remove those covers.

    h. Refer to Figure 52.
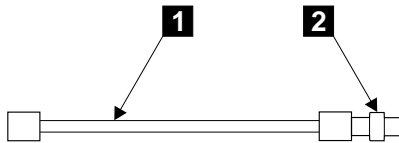
Figure 52. Wrap Cable and Wrap Adapter

    i. Disconnect the wrap cable **1** from the wrap adapter **2** .

    j. Refer to Figure 53.

Figure 53. Wrapped Optical Extender

k. Connect the wrap cable **1** to the connectors of the optical extender.

Does the Receive light of the optical extender come on?

NO

    a. Remove the wrap cable from the optical extender, and do whichever of the two following actions is appropriate:

       • If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.

       • If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

    b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

    c. Exchange the optical extender for a new one.

    d. Observing the identifications of the fibre optic cables, connect the cables to the new optical extender.

    e. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

> **Note:** If the problem remains, find another wrap cable and adapter assembly, and repeat this step. The original wrap cable might have failed.

YES   Go to step 10 on page 122.

Step 10. (from step 9)

Is a multi-mode conditioner present in the optical link?

NO   Go to step 12.

YES

a. In the next step, you are going to disconnect the main fibre optic cables. Before you do so, note the identifications of the main fibre optic cables to ensure that you reconnect them correctly later.

b. Refer to Figure 54.

Figure 54. Multi-Mode Conditioner and Main Fibre Optic Cables

c. Disconnect the main fibre optic cables **1** from the multi-mode conditioner.

d. Find the wrap cable and adapter assembly that is provided with the optical extender.

e. Remove the wrap cable and adapter assembly from its plastic bag.

f. If the wrap cable and adapter assembly has a protective cover at each end, remove those covers.
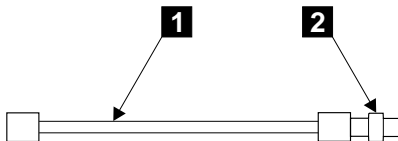
g. Refer to Figure 55.

Figure 55. Wrap Cable and Wrap Adapter

h. Disconnect the wrap cable **1** from the wrap adapter **2** .

i. Refer to Figure 56.

Figure 56. Wrapped Multi-Mode Conditioner

j. Connect the wrap cable **1** to the connectors of the multi-mode conditioner.

k. Go to step 11.

Step 11. (from step 10)

Does the Receive light of the optical extender come on?

NO

a. Remove the wrap cable from the multi-mode conditioner, and do whichever of the two following actions is appropriate:

- If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.
- If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

c. Exchange the multi-mode conditioner for a new one.

d. Observing the identifications of the main fibre optic cables, connect the cables to the new multi-mode conditioner.

e. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Note: If the problem remains, find another wrap cable and adapter assembly, and repeat this step. The original wrap cable might have failed.

YES

a. Remove the wrap cable from the multi-mode conditioner, and do whichever of the two following actions is appropriate:

- If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.
- If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

      b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

      c. Go to step 12.

Step 12. (from step 9)

One of the following conditions exists:
- The light output from this optical extender is low.
- The main fibre optic cables are failing.

a. Refer to Figure 57.
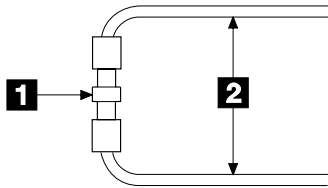
Figure 57. Wrapped Main Fibre Optic Cables

      b. Use the wrap adapter **1** to wrap (connect) the two main fibre optic cables **2** together.

      c. Check the Receive light of the optical extender that is at the other end of the optical link.

Is the Receive light on?

NO   A main fibre optic cable has failed. Tell the customer.

YES   The optical extender that is disconnected from the fibre optic cables has failed.

      a. Remove the wrap cable from the optical extender, and do whichever of the two following actions is appropriate:
- If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.
- If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

      b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

      c. Exchange the optical extender for a new one.

      d. Observing the identifications of the fibre optic cables, connect the cables to the new optical extender.

      e. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 13. (from step 3)

- If the optical extender is plugged into an SSA attachment, observe the green light (if present) that is next to the connector on the attachment.
- If the optical extender is not plugged into an SSA attachment, or is plugged into an SSA attachment that has no green light, observe the Ready light of the first disk drive module on the string to which the optical extender is connected.

Is the Ready light on continuously?

NO Go to step 15 on page 126.

YES Go to step 14.

Step 14. (from step 13)

The device is receiving SSA signals correctly.

Have you checked both ends of the optical link?

NO

    a. Find the optical extender that is at the other end of the link.

    b. Go to step 2 on page 111.

YES No trouble found with this link.

Step 15. (from step 13)

     a. In the next step, you are going to disconnect the fibre optic cables. Before you do so, note the identifications of the fibre optic cables to ensure that you reconnect them correctly later.

     b. Refer to Figure 58.
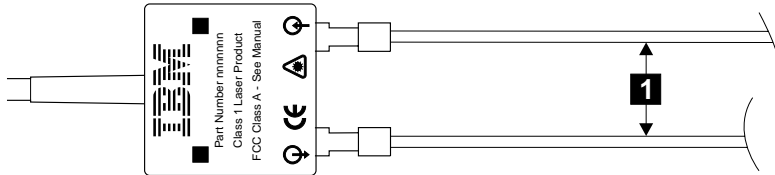
Figure 58. Optical Extender and Fibre Optic Cables

     c. Disconnect the fibre optic cables **1** from the optical extender.

     d. Find the wrap cable and adapter assembly that is provided with the optical extender.

     e. Remove the wrap cable and adapter assembly from its plastic bag.

     f. If the wrap cable and adapter assembly has a protective cover at each end, remove those covers.

     g. Refer to Figure 59.

Figure 59. Wrap Cable and Wrap Adapter

     h. Disconnect the wrap cable **1** from the wrap adapter **2** .

i. Refer to Figure 60.
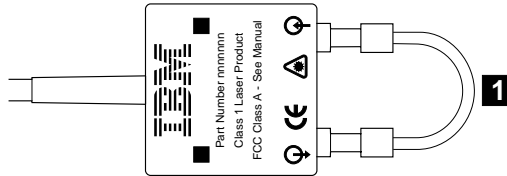
Figure 60. Wrapped Optical Extender

j. Connect the wrap cable **1** to the connectors of the optical extender.

Does the Receive light of the optical extender come on?

NO

    a. Remove the wrap cable from the optical extender, and do whichever of the two following actions is appropriate:

       • If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.

       • If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

    b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

    c. Exchange the optical extender for a new one.

    d. Observing the identifications of the fibre optic cables, connect the cables to the new optical extender.

    e. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

       Note: If the problem remains, find another wrap cable and adapter assembly, and repeat this step. The original wrap cable might have failed.

YES   Go to step 16 on page 128.

Step 16. (from step 15)

- If the optical extender is plugged into an SSA attachment, observe the green light (if present) that is next to the connector on the adapter.
- If the optical extender is not plugged into an SSA attachment, or is plugged into an SSA attachment that has no green light, observe the Ready light of the first disk drive module on the string to which the optical extender is connected.

Is the Ready light on continuously?

NO   Go to step 17.

YES   Go to step 19 on page 130.

Step 17. (from step 16)

Is the Ready light flashing?

NO

  a. Remove the wrap cable from the optical extender, and do whichever of the two following actions is appropriate:

- If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.
- If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

  b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

  c. Observing the identifications of the main fibre optic cables, reconnect the cables to the optical extender.

  d. Exchange, in the sequence shown, the following FRUs for new FRUs. Ensure that for *each* FRU exchange, you go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

    1) The disk drive module (see "Disk Drive Modules and Dummy Disk Drive Modules" on page 150).

    2) If present, the dummy disk drive modules that are between the connector and the first disk drive module of the string (see "Disk Drive Modules and Dummy Disk Drive Modules" on page 150).

    3) If present, any other card that is installed between the optical extender and the first disk drive module.

    4) The SSA attachment (see the *Installation and Service Guide*, or equivalent, for the using system).

YES   Go to step 18 on page 129.

Step 18. (from step 17)

    a. Remove the wrap cable from the optical extender, and do whichever of the two following actions is appropriate:

- If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.

- If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

    b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

    c. Observing the identifications of the fibre optic cables, reconnect the cables to the optical extender.

Is the Ready light flashing?

NO   The problem is in the 7133 or in the SSA attachment. Go to "MAP 2010: 7133 Models D40 and T40 – START" on page 87.

YES

    a. Disconnect the fibre optic cables from the optical extender.

    b. Exchange the optical extender for a new one.

    c. Observing the identifications of the fibre optic cables, connect the cables to the new optical extender.

    d. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

Step 19. (from step 16)

The disk drive module is receiving SSA signals correctly.

Have you checked both ends of the optical link?

NO

a. Remove the wrap cable from the optical extender, and do whichever of the two following actions is appropriate:

- If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.
- If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

c. Observing the identifications of the fibre optic cables, reconnect the cables to the optical extender.

d. Find the optical extender that is at the other end of the link.

e. Go to step 2 on page 111.

YES

a. Remove the wrap cable from the optical extender, and do whichever of the two following actions is appropriate:

- If the wrap cable is 400 mm (15 in.) long, connect each of its ends to the wrap adapter to make a closed loop.
- If the wrap cable is 150 mm (6 in.) long, connect one end to the wrap adapter, then install a protective cover at each end of the complete wrap cable and adapter assembly.

b. Place the wrap cable and adapter assembly into its plastic bag, and return it to the place where it is normally kept.

c. Exchange the optical extender for a new one.

d. Observing the identifications of the fibre optic cables, reconnect the cables to the optical extender.

e. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 131 to verify the repair.

MAP 2410: 7133 Models D40 and T40 – Repair Verification

This MAP helps you to verify a repair after a FRU has been exchanged for a new one.

Attention: Unless the using system needs to be switched off for some other reason, do not switch off the using system when servicing the 7133 or an SSA link. Power cables and external SSA cables that connect the 7133 to the using system can be disconnected while that system is running.

Step 1.

Before you arrived at this MAP, you might have exchanged one or more FRUs for new FRUs. Some of those FRUs have Power lights (for example, disk drive modules and power supply assemblies). Check whether all those Power lights are on.

Do all the FRUs you have exchanged have their Power lights on (where applicable)?

NO

a. Exchange, for a new one, the FRU whose Power light is off.

b. Go to step 2.

YES Go to step 2.

Step 2. (from step 1)

Are all Check lights off or showing green?

NO Go to "MAP 2010: 7133 Models D40 and T40 – START" on page 87.

YES

a. Run concurrent diagnostics to the device that reported the problem.

If the original problem was not reported by a device, run concurrent diagnostics to each SSA attachment in the using system. For information about how to run concurrent diagnostics, see Concurrent Diagnostics in the "Additional Information" appendix (in this book) for your using system.

If the diagnostics fail, return to "MAP 2010: 7133 Models D40 and T40 – START" on page 87.

b. Run the appropriate service aid or function to ensure that the error log entry for the problem that you have just corrected does not cause an SRN to be generated when diagnostics or error log analysis is run in the future. See Problems Corrected in the "Additional Information" appendix (in this book) for your using system.

SSA Link Errors

SSA link errors can be caused if:
- Power is removed from an SSA device.
- An SSA device is failing.
- An SSA device is removed.
- A cable is disconnected.
- Bypass card modes have been set incorrectly.

Such errors might be indicated by:
- SRN 45PAA
- A flashing link status (or Ready) light on the SSA device at each end of the failing link
- The indication of an open link by a link verification service aid

Resetting Bypass Card Modes

If the bypass card modes have been set in such a way that the using system can no longer get access to the 7133, you cannot use the service functions to change those modes. You can, however, manually reset the modes to their default settings.

Attention: When you reset the modes manually, *all* bypass cards that are not jumpered for Forced Inline mode are reset to Automatic mode in this 7133. Your configuration might be seriously affected.

To reset the modes, hold all three ID push buttons (see "ID push buttons" on page 11) pressed until the display flashes after approximately 10 seconds. All bypass cards that are not jumpered for Forced Inline mode are reset to Automatic mode in this 7133.

SSA Link Error Problem Determination

Instead of using the normal MAPs to solve a link error problem, you can refer directly to the link status lights to isolate the failing FRU. The descriptions given here show you how to do this.

In an SSA loop, SSA devices are connected through two or more SSA links to an SSA attachment. Each SSA link is the connection between two SSA nodes (devices or adapters); for example, disk drive module to disk drive module, SSA attachment to disk drive module, or SSA attachment to SSA attachment.

An SSA link can contain several parts. When doing problem determination, think of the link and all its parts as one complete item.

Here are some examples of SSA links. Each link contains more than one part.

Example 1

In Figure 61, the SSA link is between two disk drive modules that are in the same SSA subsystem or 7133. It has three parts.

SSA Subsystem

| Disk
Drive 1 | Internal
Connection | Disk
Drive 2 |
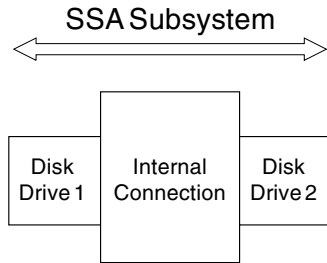
Figure 61. Three-Part Link in One Subsystem

Example 2

In Figure 62, the SSA link is between two disk drive modules that are in the same SSA subsystem or 7133. It has five parts, although the two backplane parts are on the same backplane assembly of the SSA subsystem.

SSA Subsystem

| Disk
Drive 1 | Internal
Connection | Dummy
Disk
Drive | Internal
Connection | Disk
Drive 2 |
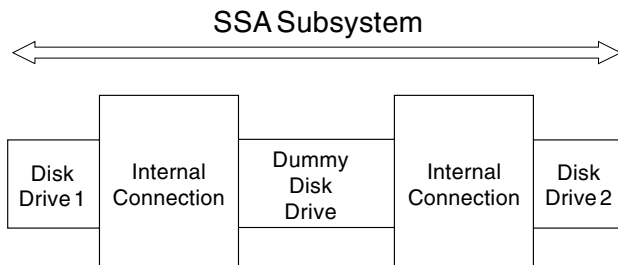
Figure 62. Five-Part Link in One SSA Subsystem

Example 3

In Figure 63, the SSA link is between two disk drive modules that are not in the same SSA subsystem or 7133. It has seven parts.

SSA Subsystem   SSA Subsystem

| Disk Drive | Internal Connection | SSA Connector Card | Cable | SSA Connector Card | Internal Connection | Disk Drive |
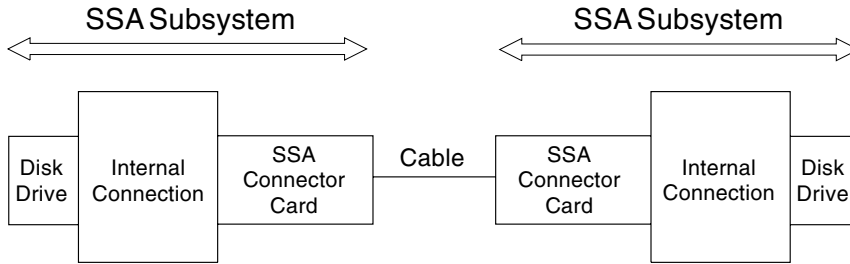
Figure 63. Seven-Part Link in One Subsystem

Example 4

In Figure 64, the SSA link is between a disk drive module and an SSA adapter (or attachment). It has five parts.

SSA Subsystem

| Disk Drive | Internal Connection | SSA Connector Card | Cable | Adapter |
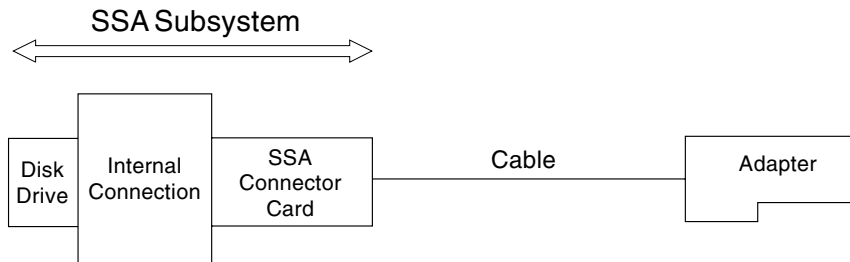
Figure 64. Five-Part Link between Disk Drive Module and SSA Attachment

Example 5

In Figure 65, the SSA link is between two SSA adapters (or attachments). It has five parts. Note that it has fibre optic cables and optical extender instead of normal SSA cables.

| Adapter | Optical Connector | Fiber Optic Cables | Optical Connector | Adapter |
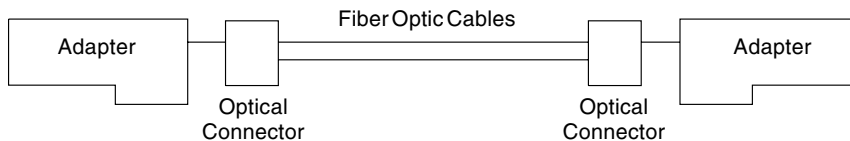
Figure 65. Five-Part Link between Two Adapters

Link Status (Ready) Lights

If a fault occurs that prevents the operation of a particular link, the link status lights of the various parts of the complete link show that the error has occurred.

You can find the failing link by looking for the flashing green status light at each end of the affected link. Some configurations have other indicators along the link (for example, on bypass cards or optical extenders) to help with FRU isolation.

The meanings of the lights are summarized here. If you need more information about the lights, see:

- "Lights and Controls" on page 5 for disk drive lights and bypass card lights of the 7133
- The user or maintenance information for your using-system SSA attachment hardware for the lights of the SSA attachment.

Summary of Disk Drive and SSA Attachment Lights

Link Status (Ready) Light:

Status of Light	Meaning
Off	Both SSA links are inactive. For more information, see "Disk Drive Module Lights" on page 15.
Permanently on	Both SSA links are active.
Slow flash (two seconds on, two seconds off)	Only one SSA link is active.

Summary of Bypass Card Lights

For a description of the functions of the bypass card, see "SSA Bypass Cards" on page 41.

Link Status (Ready) Light (one for each port):

Status of Light	Meaning
Off	One of the following:
	• The path through this port is not operational.
	• The card is switched into Bypass state (mode light shows amber).
	• The card is jumpered for Forced Inline mode (mode light shows green).
Permanently on	The path through this port is operational.
Flashing	The path through this port is not operational.

Mode Light (two-colored LED):

Status of Light	Meaning
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 state.

Optical Extender Lights

Power light: This light is on when the +5-volt input is present.

Receive light: This light, when on, shows that light is being received at the input connector of the optical extender. The received light might not be a valid SSA signal.

If you have problems with the optical extender go to "MAP 2330: 7133 Models D40 and T40 – Optical Extender" on page 109.

Displaying Link Problems

If SSA service aids, 7133 service aids, or both, are available, you can use them to show whether the SSA loop is broken. For an example, see Displaying Link and Power Problems in the "Additional Information" appendix (in this book) for your using system.

Chapter 3. Removal and Replacement Procedures

Are You Using the Correct Book? *Do not use this book if you are servicing a 7133 Model 010, 020, 500, or 600 SSA Disk Subsystem.* For the correct book, see Related Publications in the "Additional Information" appendix (in this book) for your using system.

These instructions describe how to remove field-replaceable units (FRUs) from the 7133 Models D40 and T40.

Each FRU has its own removal procedure, for example, "Power Supply Assembly". Where a *step* in a specific procedure represents a complete *procedure* that is described separately, a reference to that procedure is given.

The references show you where to find more detail, if you need it.

Note: Because these instructions relate to Model D40 and to Model T40, some diagrams might not specifically show the model that you are servicing.

Concurrent Maintenance

Subject to the configuration of the 7133, most FRUs can be removed, replaced, and tested while the subsystem and using system are powered on and doing productive work. This ability is called 'concurrent maintenance'. Unless you have a particular reason to do so, do not remove the power unless these instructions tell you to do so.

The following FRUs *can* be maintained concurrently in a fully-configured subsystem:
- Fan assembly
- Power supply assembly
- Disk drive module
- Dummy disk drive module
- Controller card assembly
- Operator panel assembly and flexible circuit (Model D40 only)
- Disk drive status light assembly (Model D40 only)
- External SSA cable.

The following FRUs *cannot* be maintained concurrently:
- Bypass card, because it contains two separate SSA interfaces
- Operator panel assembly and flexible circuit (Model T40 only)
- Disk drive status light assembly (Model T40 only).

Covers

This section describes how to:
- Open the operator panel flap
- Open or remove the front cover of a Model D40
- Open the front cover of a Model T40
- Open the back cover of a Model T40 (Model D40 has no back cover).

Note: Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing, opening, installing, or closing the covers of the 7133.

Operator Panel Flap

Step 1. Refer to Figure 66.
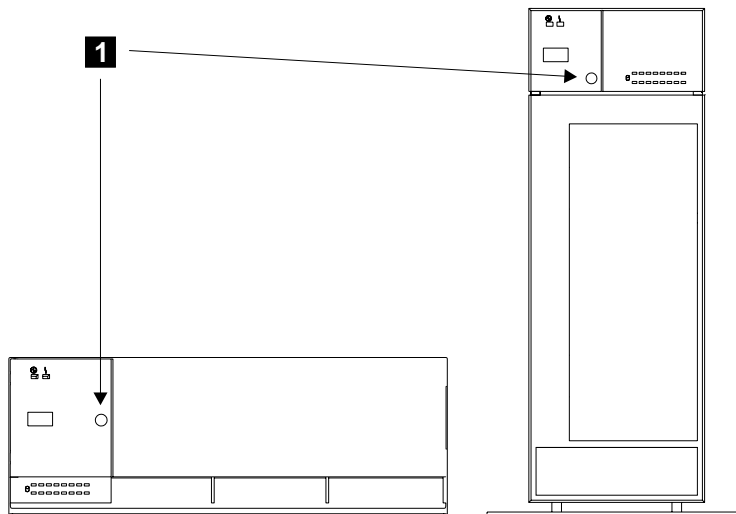
Figure 66. Opening the Operator Panel Flap

Step 2. Press and release the latch button **1** . The flap pivots to the left.

Front Cover (Model D40)

Step 1.   Refer to Figure 67.
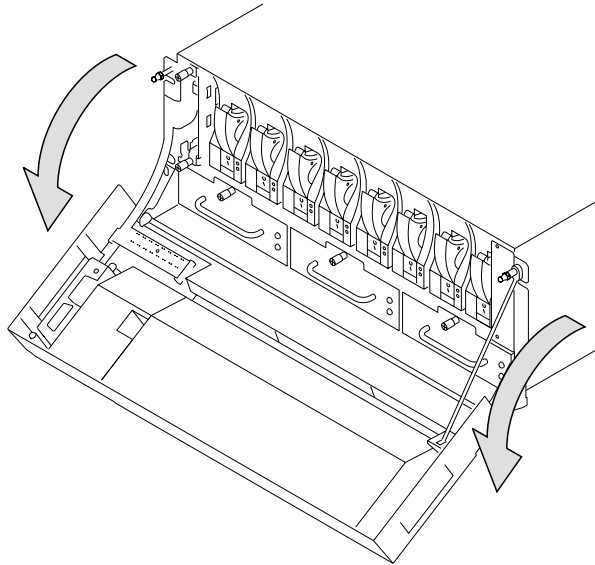
Figure 67. Opening the Front Cover of Model D40

Step 2.   To open the front cover, hold it at the sides, and pivot it downward.

Step 3. To remove the front cover assembly:

a. Refer to Figure 68.
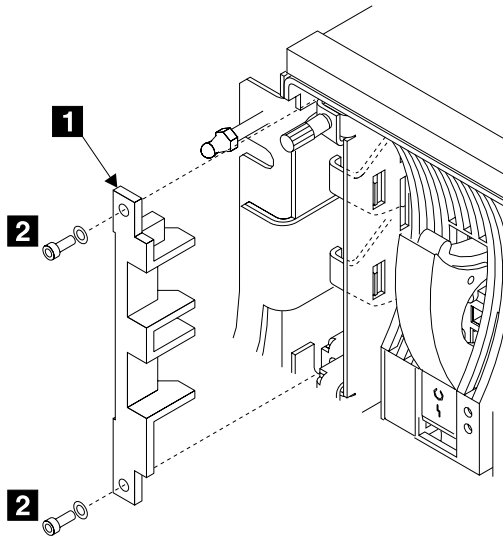
Figure 68. Removing the Latch Retainer

b. If a latch retainer **1** is present, remove the two screws **2** and the latch retainer.

c. Refer to Figure 69.
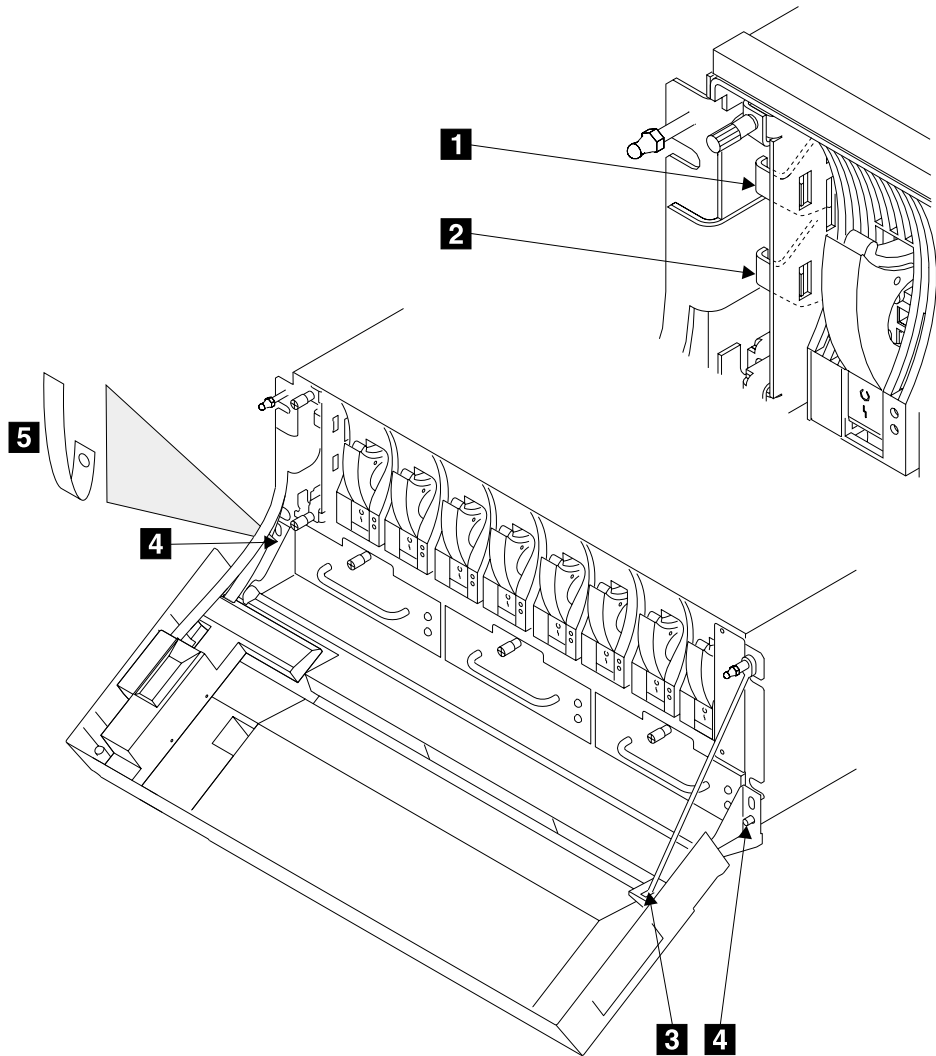
Figure 69. Removing the Front Cover

d. Move the latch **2** to your left, then pull it forward to unplug the operator-panel flexible circuit from the controller card assembly.

   Note: If mainline electrical power is present in the 7133, and the 7133 power switch is set to Standby, the internal dc power switches on when the operator panel flexible circuit is disconnected from the controller card assembly. The dc power remains switched on when the circuit is reconnected.

e. Do the same actions with the latch **1** to unplug the disk-drive-status-light flexible circuit from the controller card assembly.

f. Disconnect the support strap **3** from the front cover.

g. Remove the two locknuts **4** and, if present, the plastic cable shield **5**. Do not lose the plastic cable shield.

h. Remove the front cover assembly.

Step 4. Replace parts in the reverse sequence.

Note: Ensure that the latches of the operator panel flexible circuit and the disk drive status lights flexible circuit engage fully in the slots of the 7133 frame assembly.

Front Cover (Model T40)

Step 1.   Ask the customer for the key to the covers.

Step 2.   Refer to Figure 70.
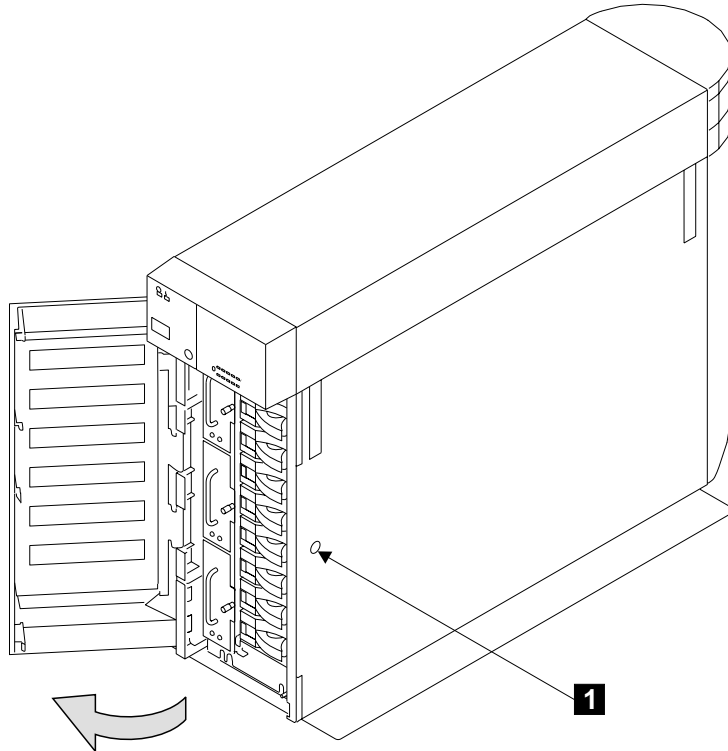
Figure 70. Opening the Front Cover of a Model T40

Step 3.   Insert the key into the lock **1** , and turn the key counterclockwise.

Step 4.   The cover is pivoted on its left-hand side, and is held closed by clips. Pull strongly on the right-hand side of the cover to release it from the clips.

Back Cover (Model T40)

Step 1. Ask the customer for the key to the covers.

Step 2. Refer to Figure 71.
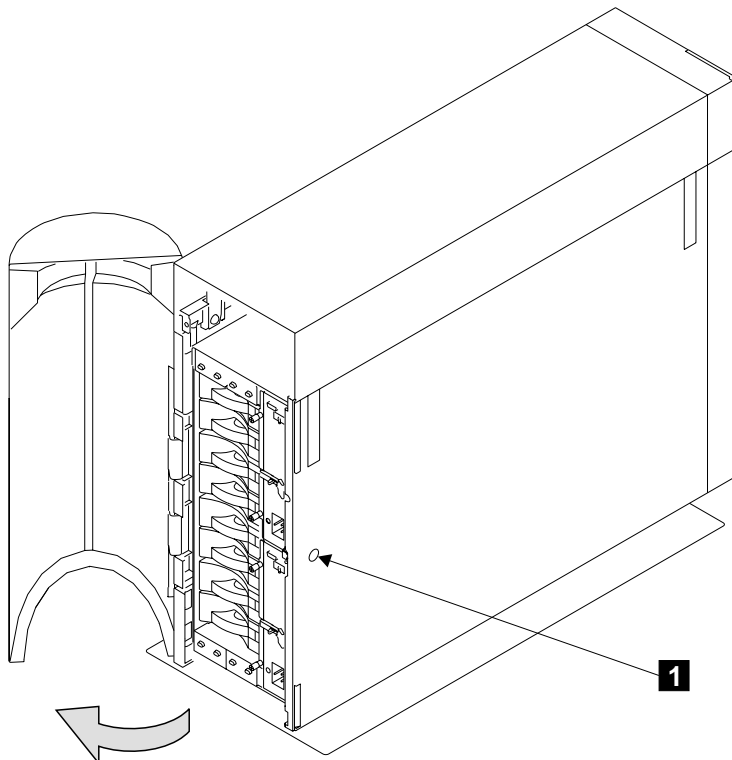
Figure 71. Opening the Back Cover of a Model T40

Step 3. Insert the key into the lock **1** , and turn the key counterclockwise.

Step 4. The cover is pivoted on its left-hand side, and is held closed by clips. Pull strongly on the right-hand side of the cover to release it from the clips.

All Power

Note: Unless you have a particular reason to do so, or the instructions that you are following tell you to do so, do not remove power from the using system or from the 7133.

This section has two parts:
- "Power (Model D40)" on page 146
- "Power (Model T40)" on page 148.

Go to the part that is relevant to the Model of 7133 you are servicing.

Power (Model D40)

Step 1. Verify with the customer that all operations between the 7133 and the using system have been stopped.

Step 2. Refer to Figure 72.
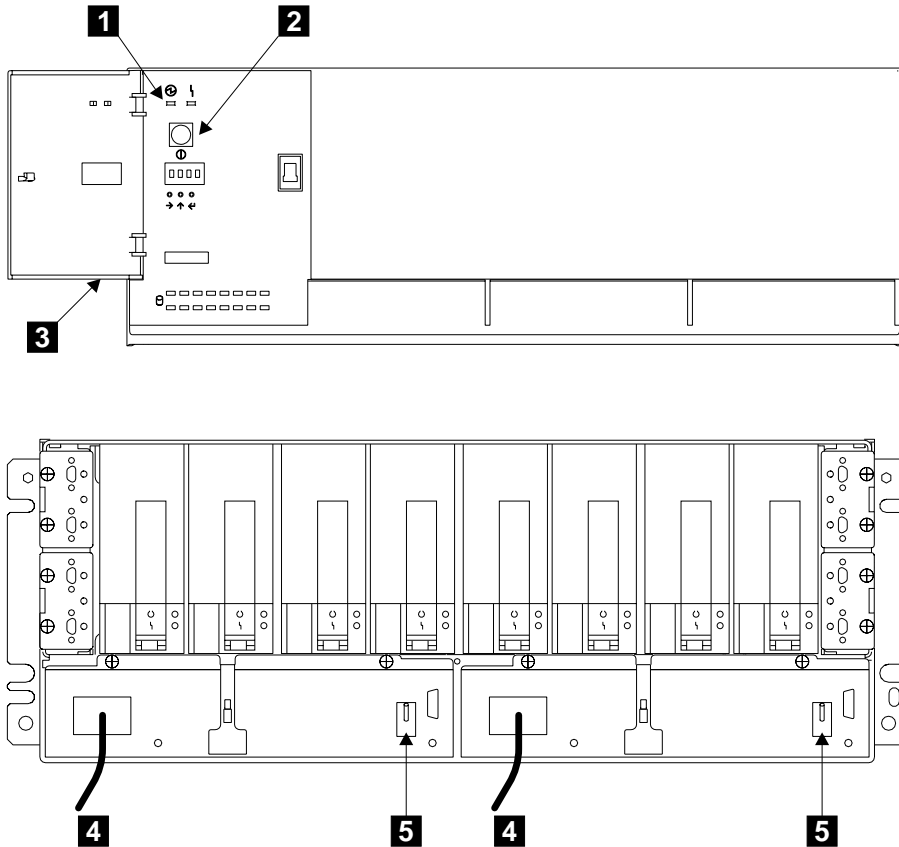
Figure 72. Removing the Power from a Model D40

Step 3. Observe the 7133 Power light **1** . If the light is on, open the operator panel flap **3** (see "Operator Panel Flap" on page 138).

Step 4. Press and release the Power switch **2** .

The 7133 Power light flashes.

Step 5. Switch off both power supply assemblies. For each assembly, push the PWR/FAULT RESET switch **5** downward.

> **Note:** On early power supply assemblies, pull the switch outward, then push it downward.

Note: For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

DANGER

> **In the following step you are going to remove the power cable. This cable is live if the rack power distribution unit or battery-backup unit is still switched on.**

Step 6. Remove the power cables **4** from the back of the 7133.

Step 7. To return power to the 7133:

    a. Reinstall the power cables **4** .

       Attention:

- *Never use power cables from a 7133 Model 010, 020, 500, or 600 to connect a 7133 Model D40 to the mainline power outlet. Use only the shielded power cables that are supplied with the 7133 Model D40.*

- On –48 volt models, ensure that one power supply assembly is connected to power source A in the rack, and that the other is connected to power source B (see the *7133 Model D40 Serial Disk System: Installation Guide* for details).

    b. Switch on both power supply assemblies. For each assembly, push the PWR/FAULT RESET switch **5** upward.

       Note: On early power supply assemblies, pull the switch outward, then push it upward.

       Power is restored to the 7133. You do not need to press the power switch.

Note: The 7133 Models D40 and T40 have no power sequencing. All the disk drive modules start their power sequence when the input voltages are inside the specified limits. Their motors are started under control of the SSA attachments in the using system. To prevent the need for excessive electrical current, the disk drive module motors are not all started together. Up to eight disk drive modules can be started together. At least 10 seconds must elapse before the next group of motors is started. Normally, all the disk drive module motors are running in less than 30 seconds from the time the 7133 is switched on.

Power (Model T40)

Step 1. Verify with the customer that all operations between the 7133 and the using system have been stopped.

Step 2. Refer to Figure 73.
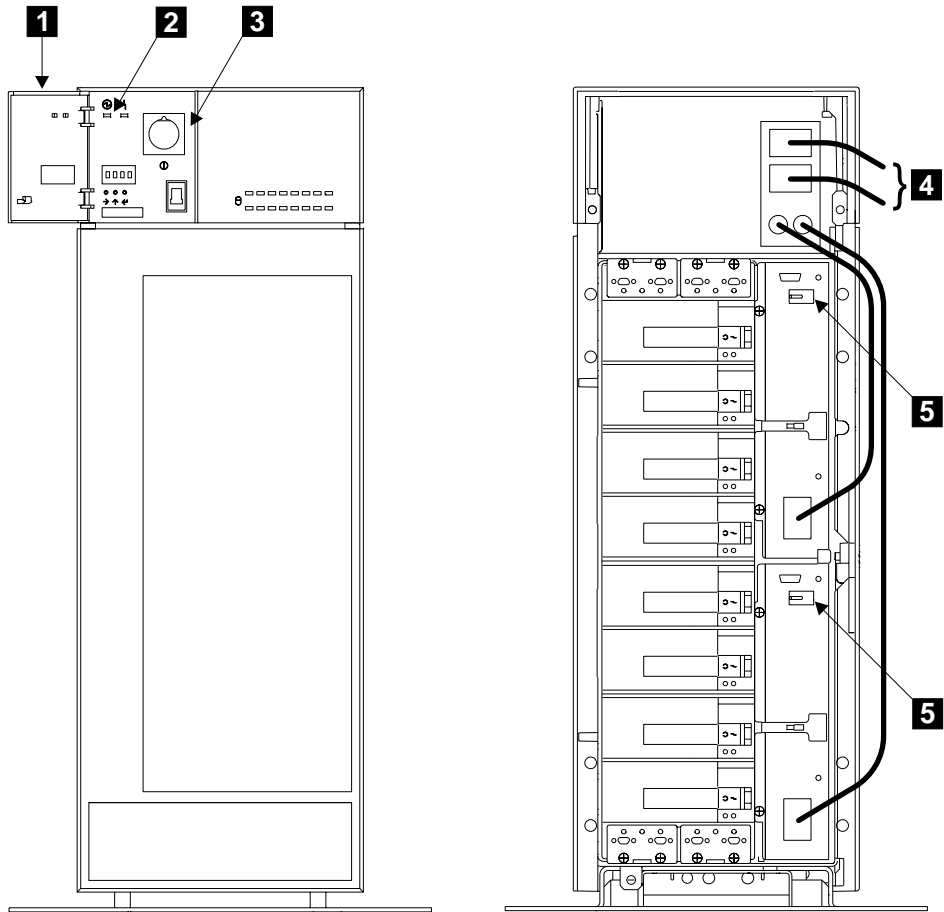
Figure 73. Removing Power from a Model T40

Step 3. Observe the 7133 Power light **2** . If the light is on, open the operator panel flap **1** (see "Operator Panel Flap" on page 138).

Step 4. Press and release the Power switch **3** .

The 7133 Power light and the 7133 Check light might go off, come on, and go off a few times while the power goes down.

Step 5. Open the back cover if not already open (see "Covers" on page 138).

Step 6. Remove the power cables **4** from the electrical power outlet and from the back of the 7133.

Step 7. To return power to the 7133:

  a. Reinstall the power cables **4** .

  b. Ensure that both power supply assemblies are switched on (that is, the PWR/FAULT RESET switch **5** of each power supply assembly is pointing to the left). To switch on a power supply assembly, push the PWR/FAULT RESET switch leftward.

    Note: On early power supply assemblies, pull the switch outward, then push it leftward.

  c. Press and release the Power switch.

  Note: The 7133 Models D40 and T40 have no power sequencing. All the disk drive modules start their power sequence when the input voltages are inside the specified limits. Their motors are started under control of the SSA attachments in the using system. To prevent the need for excessive electrical current, the disk drive module motors are not all started together. Up to eight disk drive modules can be started together. At least 10 seconds must elapse before the next group of motors is started. Normally, all the disk drive module motors are running in less than 30 seconds from the time the 7133 is switched on.

Disk Drive Modules and Dummy Disk Drive Modules

Note: A disk drive module is one FRU. Always exchange it as a complete FRU.

Removing a Module

Attention:

- Disk drive modules are fragile. Handle them with care, and keep them well away from strong magnetic fields.
- Any slot that has no disk drive module installed *must* contain a dummy disk drive module. The dummy module provides continuity of the SSA string, and ensures that the correct airflow is maintained around the disk drive modules in the other slots.

Notes:

1. Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing disk drive modules or dummy disk drive modules.
2. The diagrams in these instructions show a 7133 Model D40. The procedure for a 7133 Model T40 is the same, except that everything is turned through 90 degrees.

Step 1. Locate the module that you are going to remove. (If you are removing a disk drive module, see also "Physical Location of a Device" on page 59.)

Step 2. If not already done:

- Open the front cover if you are removing a module from the front of the 7133.
- Open the back cover if you are removing a module from the back of a Model T40.

Step 3. If you are removing a dummy disk drive module, go to step 9 on page 151.

If you are removing a disk drive module, go to step 4.

Step 4. Observe the Check light on the disk drive module that you are going to remove. If the light is on, go to step 9 on page 151. Otherwise, go to step 5.

Step 5. If you are removing the disk drive module under concurrent maintenance (see "Concurrent Maintenance" on page 137), first ensure that the using system is not using that module. For more information, see Disk Drive Modules in Use in the "Additional Information" appendix (in this book) for your using system.

Step 6. If necessary, use the Identify function to find the disk drive module that you want to remove.

Step 7. If the disk drive module is to be exchanged for a new one, and the data on the disk is still accessible, ask the customer to make a backup of that data so that it can be installed onto the replacement disk drive.

Step 8. Use the Set Service Mode service aid to put into Service mode the disk drive module that you are removing (see the chapter about SSA service aids in the user or maintenance information for your using-system SSA attachment hardware).

> **Note:** You can put into Service mode only disk drive modules that are in a closed SSA loop or at the end of an SSA string. Only one disk drive module at a time can be in Service mode.
>
> If you are removing several disk drive modules at the same time:
> a. Choose any one of the disk drive modules that you are going to remove.
> b. Put that disk drive module into Service mode.
> c. Remove the disk drive module, as described in steps 9 through 17.
> d. Reset Service mode.
> e. **Attention:** When you remove the remainder of the disk drive modules, remove each module only when the slot that is next to it becomes empty.
>
>   Repeat this procedure for one disk drive module at a time, ensuring that you always remove a module that is next to an empty slot.

Step 9. Refer to Figure 74.
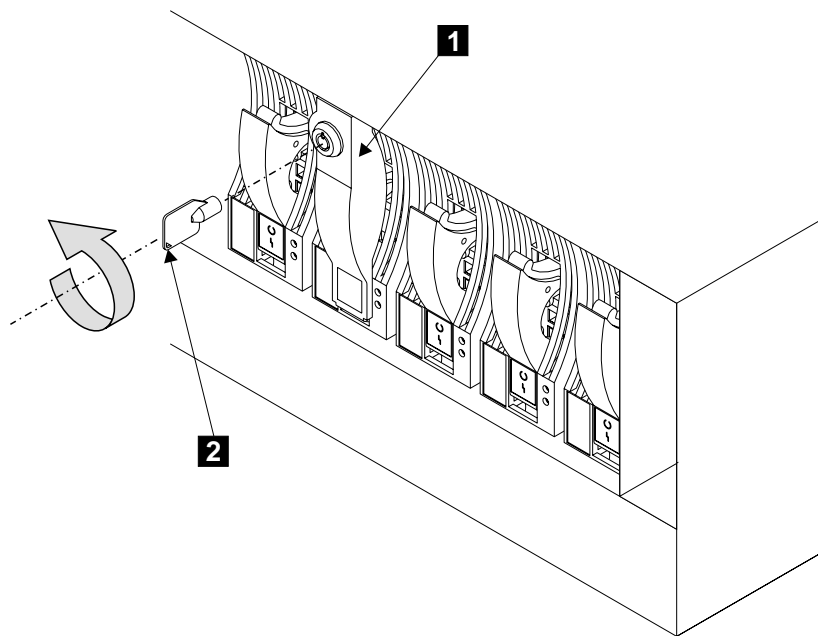
Figure 74. Removing the Lock from a Module (1)

Step 10. If the module has a lock **1**, go to step 11.

If the module does not have a lock, go to step 14 on page 153.

Step 11. Ask the customer for the key. Insert the key **2** into the lock, the turn the key counterclockwise.

Step 12. Refer to Figure 75.
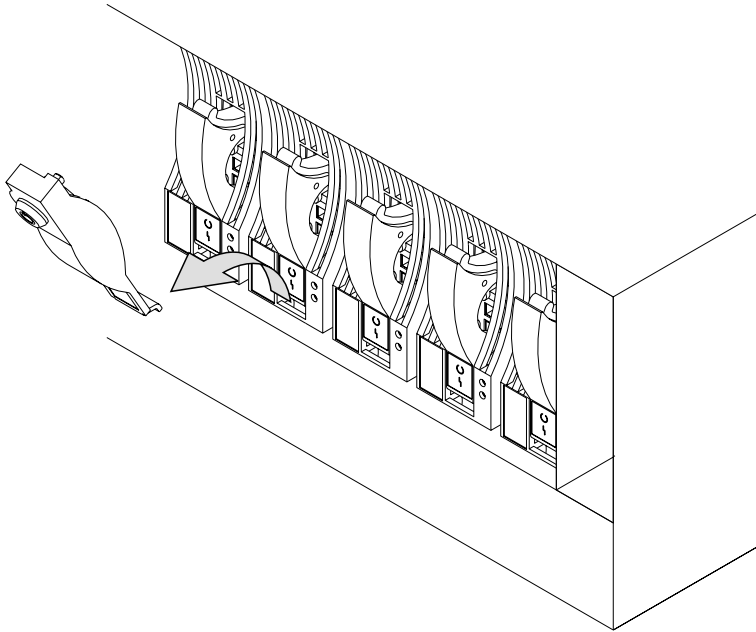
Figure 75. Removing the Lock from a Module (2)

Step 13. Pull the lock forward, then upward, to remove it.

Step 14.   Refer to Figure 76.
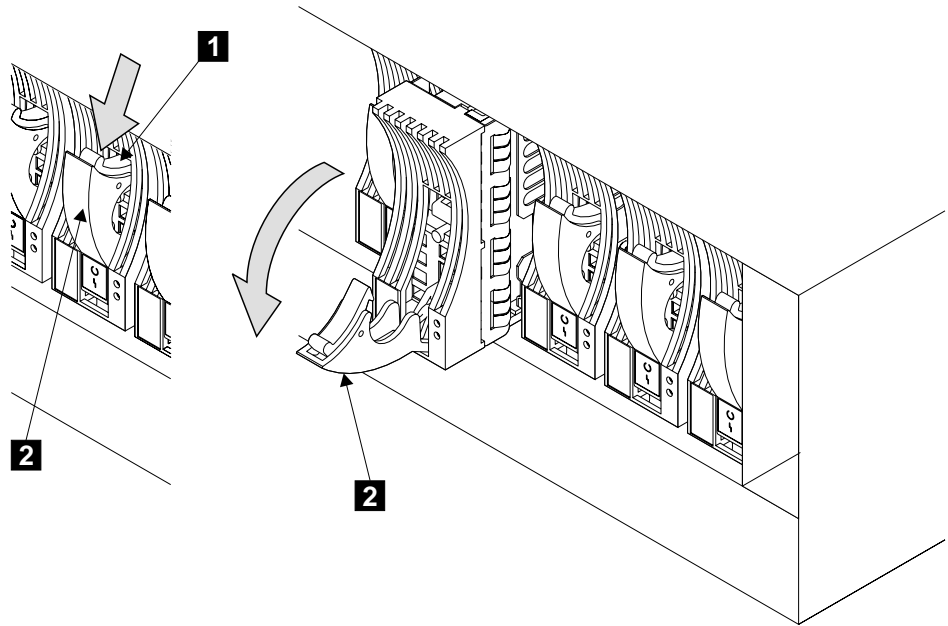
Figure 76. Opening the Handle of a Module

Step 15.   Press the blue latch **1** , and pull down the handle **2** fully. This action pulls
the module partially out of its slot.

Step 16. Refer to Figure 77.
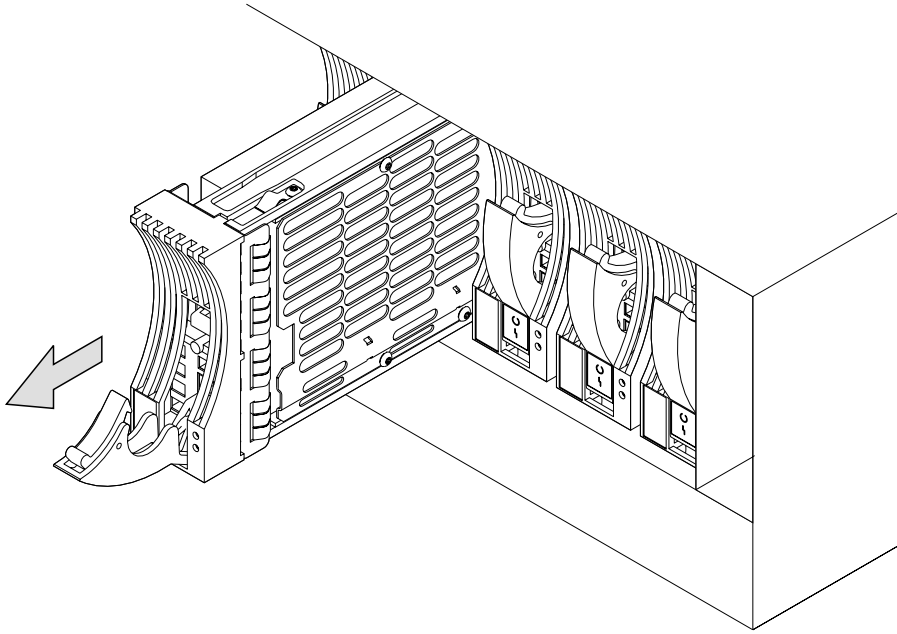
Figure 77. Removing a Module

Step 17. Grip the handle, and carefully pull out the module. As the module comes out, put one hand under its base to prevent it from falling.

Step 18. Refer to Figure 78.
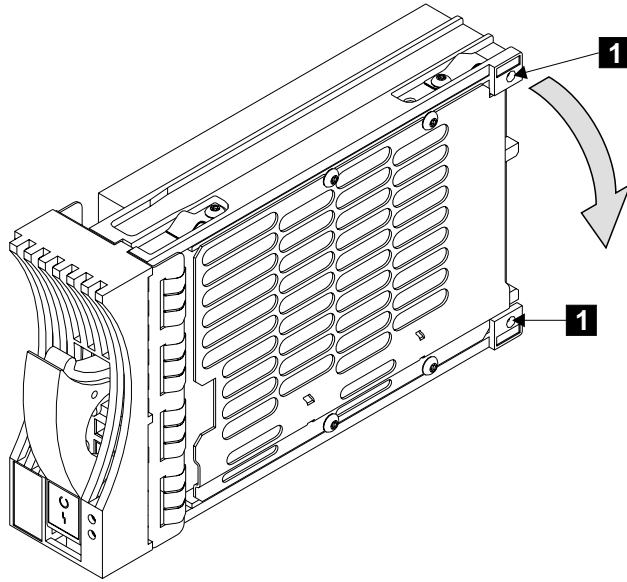
Figure 78. Placing a Module into a Safe Position

Step 19. Lay down the module so that it rests on the supports **1** .

Step 20. **Attention:** All slots must contain either a disk drive module or a dummy disk drive module. Any slot that has no disk drive module installed *must* contain a dummy disk drive module. The dummy module provides continuity of the SSA string, and ensures that the correct airflow is maintained around the disk drive modules in the other slots.

Go to "Installing a Module" on page 156, and install a disk drive module or dummy disk drive module, as required.

Installing a Module

Attention:

- Disk drive modules are fragile. Handle them with care, and keep them well away from strong magnetic fields.
- Any slot that has no disk drive module installed *must* contain a dummy disk drive module. The dummy module provides continuity of the SSA string, and ensures that the correct airflow is maintained around the disk drive modules in the other slots.

Notes:

1. Unless you have a particular reason to do so, do not switch off the using system or the 7133 when installing disk drive modules or dummy disk drive modules.
2. The diagrams in these instructions show a 7133 Model D40. The procedure for a 7133 Model T40 is the same, except that everything is turned through 90 degrees.

Step 1. If not already done:

- Open the front cover (see "Covers" on page 138) if you are installing a module into the front of the 7133.
- Open the back cover (see "Covers" on page 138) if you are installing a module into the back of a Model T40.

Step 2. If you are installing a disk drive module into a slot that already contains a disk drive module or a dummy disk drive module, remove that module (see "Removing a Module" on page 150), then go to step 3 on page 157. Otherwise, go directly to step 3 on page 157.

Step   3.   Refer to Figure 79.
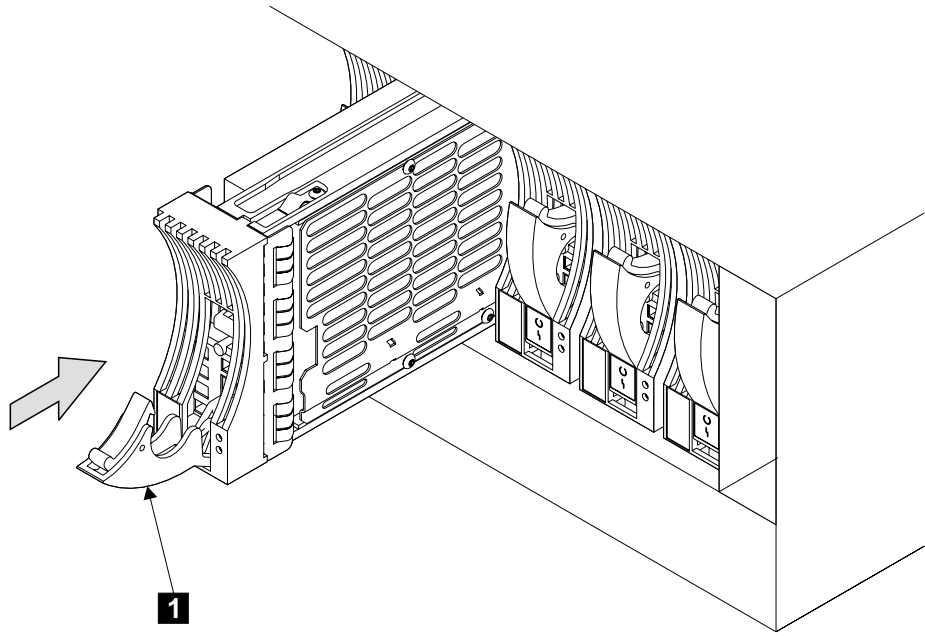
Figure 79. Installing a Module

Step   4.   Ensure that the handle **1** is fully open on the module that you are going to install.

Step   5.   With one hand giving support to the base of the module, insert the module, and push it into the slot. The module stops before it is fully home.

Step   6.   Refer to Figure 80
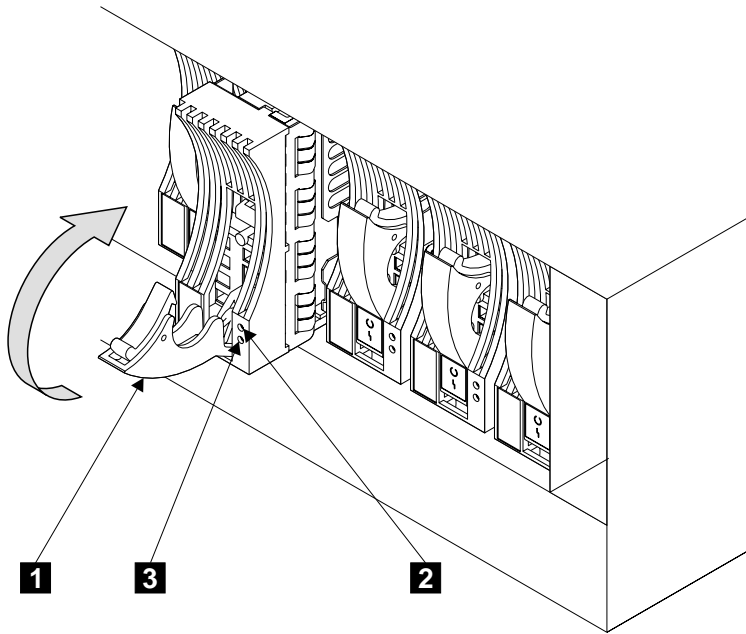
Figure 80. Closing the Handle of a Module

Step   7.   Close the handle **1** . Press it in until you hear a click. This action pushes the module fully home.

Step   8.   If you are installing a dummy disk drive module, go to step 10 on page 159.

If you are installing a disk drive module, go to step 9.

Step   9.   If the 7133 is switched on:

a. Ensure that the Check light **3** comes on immediately.

- If it comes on, go to step 9b.

- If it does not come on, go to "MAP 2010: 7133 Models D40 and T40 – START" on page 87. When you have solved the problem, return to this section, and go to step 9b.

b. Check whether the Check light goes off after approximately two seconds.

- If the Check light goes off, go to step 9c on page 159.

- If the Check light remains on, the disk drive module might be in Service mode. If the disk drive module is in Service mode, reset Service mode (see the chapter about SSA service aids in the user or maintenance information for your using-system SSA attachment hardware).

- If the Check light goes off, go to step 9c on page 159.

- If the Check light remains on, go to "MAP 2010: 7133 Models D40 and T40 – START" on page 87. When you have solved the problem, return to this section, and go to step 9c on page 159.

c. Check whether the Ready light **2** comes on.

- If the Ready light comes on and remains on continuously, or flashes quickly (five times per second), go to step 10.

- If the Ready light does not come on, or flashes slowly (two seconds on, two seconds off), go to "MAP 2010: 7133 Models D40 and T40 – START" on page 87. When you have solved the problem, return to this section, and go to step 10.

Step 10. Refer to Figure 81
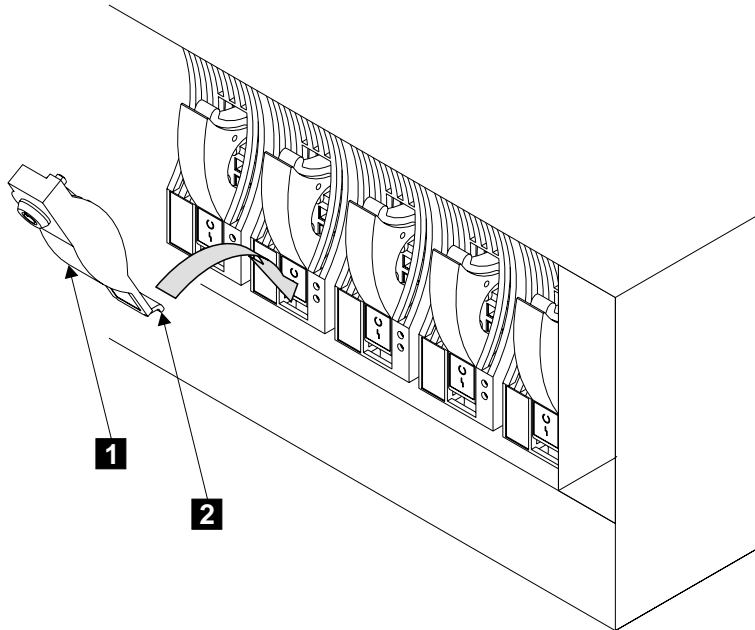
Figure 81. Installing the Lock onto a Module (1)

Step 11. If the module has a lock **1**, go to step 12.

If the module does not have a lock, go to step 16 on page 160.

Step 12. Insert the flange **2** of the lock into the slot in the front of the disk drive module.

Step 13. Refer to Figure 82.
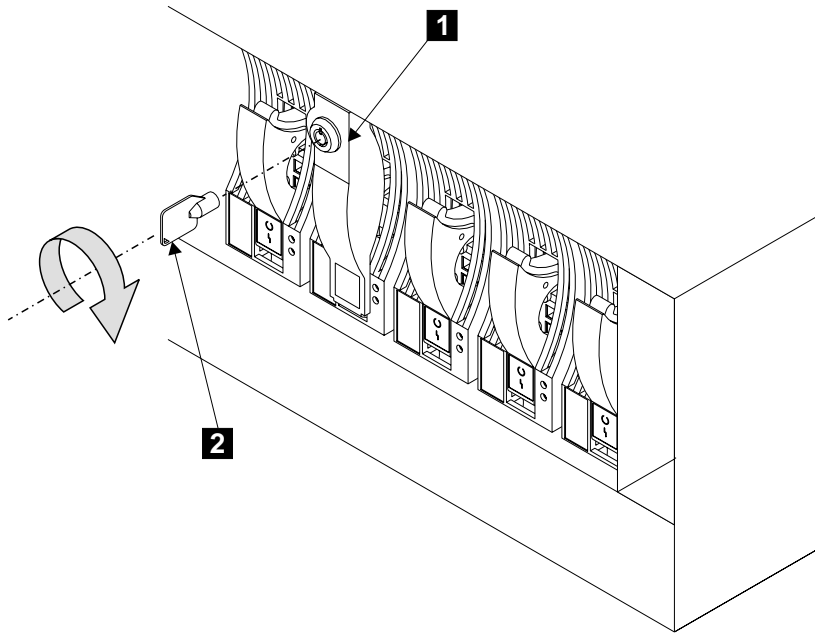
Figure 82. Installing the Lock onto a Module (2)

Step 14. Push the lock **1** over the handle of the disk drive module.

Step 15. Insert the key **2** into the lock, then turn the key clockwise. Return the key to the customer.

Step 16. Replace other parts in the reverse sequence.

Step 17. If you have just installed a dummy disk drive module, go no further with these instructions.

If you have just installed a disk drive module, go to step 18.

Step 18. If you installed the disk drive module under concurrent maintenance (see "Concurrent Maintenance" on page 137), configure the new disk drive module to your using system. For more information, see Configuring a Disk Drive Module to the Using System in the "Additional Information" appendix (in this book) for your using system.

If you installed the disk drive module while the using system was switched off, switch on the using system when you are ready to do so. When you switch on the using system, the disk drive module is automatically configured.

Step 19. Using the method that is provided on your using system, check the level of microcode that is present on the disk drive module that you have just installed. Additional information about the latest levels of disk drive microcode is given on the web support page (see Web Support Pages in the "Additional Information" appendix (in this book) for your using system). If you need to

download the latest microcode, see Downloading Disk Drive Microcode"Disk Drive Microcode Maintenance" in the "Additional Information" appendix (in this book) for your using system.

Step 20. If the 7133 is attached to a RISC system, go to step 21. Otherwise, go to step 22.

Step 21. The disk drive module that you have just installed has been configured with new hdisk and pdisk numbers. If you want to change those numbers, go to Configuring a Disk Drive Module to the Using System in the "Additional Information" appendix (in this book) for your using system. Otherwise, go to step 22.

Step 22. If the disk drive module is a replacement module, and if the customer created a backup of the data from the original disk drive module, ask the customer to install that data onto the replacement module.

Step 23. If you came to this section from a step in MAP, return to that step, and continue with the MAP.

Power Supply Assemblies

Notes:

1. Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing or installing power supply assemblies.

2. The diagrams in these instructions show a 7133 Model D40. The procedure for a 7133 Model T40 is the same, except that everything is turned through 90 degrees.

3. The diagrams in these instructions show 220-volt power supply assemblies. The mainline power connector is different on –48 volt power supply assemblies. You can use these instructions for both types of power supply assembly.

4. **Attention:** Both power supply assemblies in a 7133 must be of the same voltage rating. ***Do not mix power supply assemblies of different voltage ratings.***

Removing a Power Supply Assembly

Step 1. Refer to Figure 83.
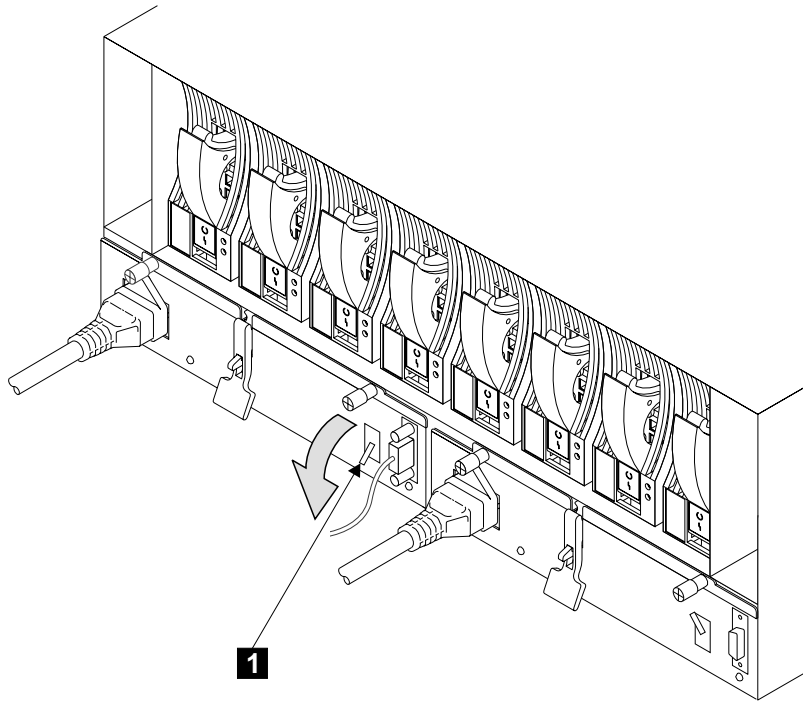
Figure 83. Switching Off a Power Supply Assembly

Step 2. Switch off the power supply assembly that you are removing. To do this, push the PWR/FAULT RESET switch **1** downward.

Notes:

a. On early power supply assemblies pull the switch outward, then push it downward.

b. You might hear the speed of the fans increase.

Step   3.   Refer to Figure 84.
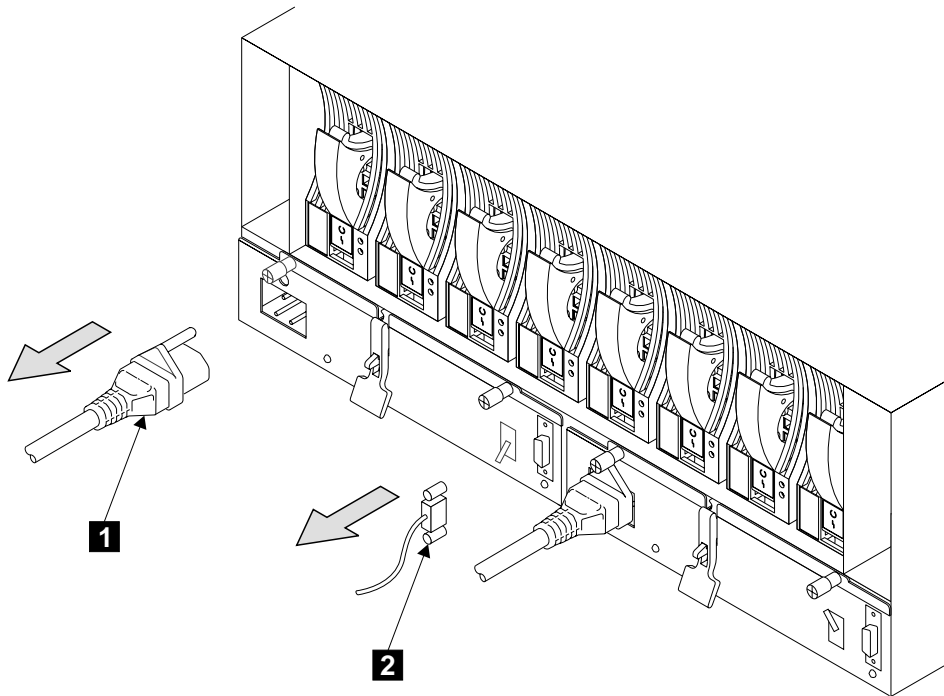
Figure 84. Removing the Power Cable and 7133 Power-Control Cable

Step   4.   At the back of the 7133, unplug the power cable ▆1 from the power supply
           assembly that you are going to remove.
Step   5.   Unplug the 7133 power-control cable ▆2 (if present) from the power supply
           assembly.

           Note: When present, the 7133 power-control cable is plugged into the power
                      supply assembly that is in position 1 (see "Parts Locations" on
                      page 17).

Step   6.   Refer to Figure 85.
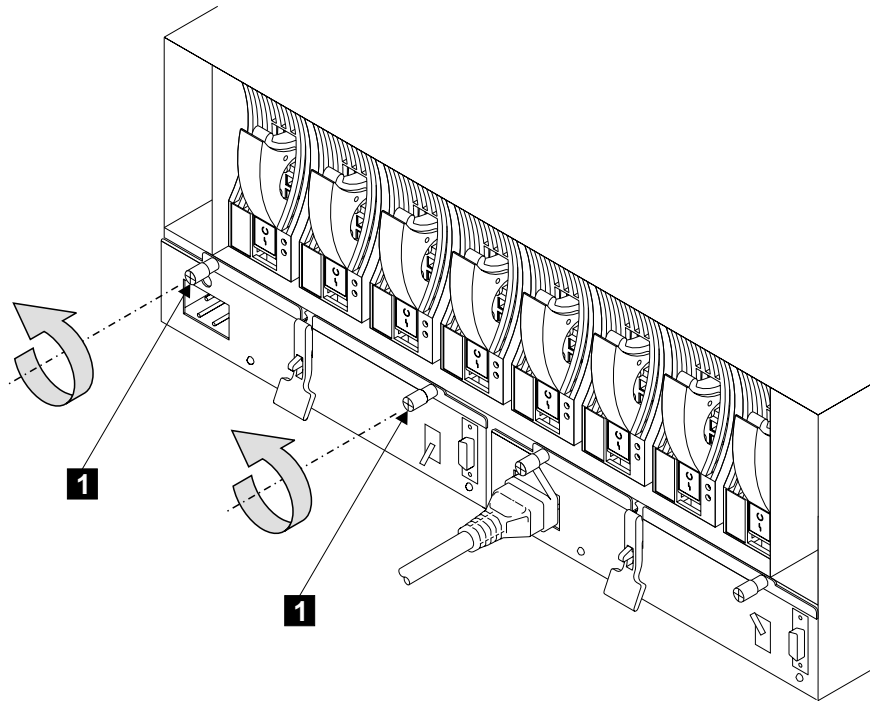
Figure 85. Unscrewing the Thumbscrews

Step   7.   Unscrew the two thumbscrews **1** on the power supply assembly.

Step   8.   Refer to Figure 86.
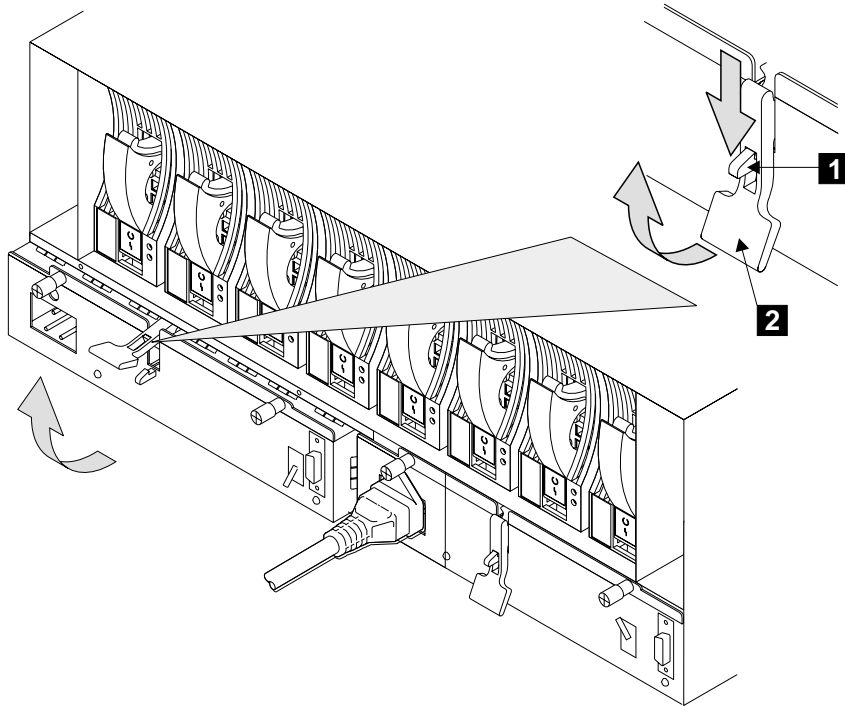
Figure 86. Using the Lever to Release the Power Supply Assembly

Step   9.   Press the latch **1** , and pull the lever **2** fully upward. These actions pull the power supply assembly partially out of its housing.

Step 10.   Refer to Figure 87.
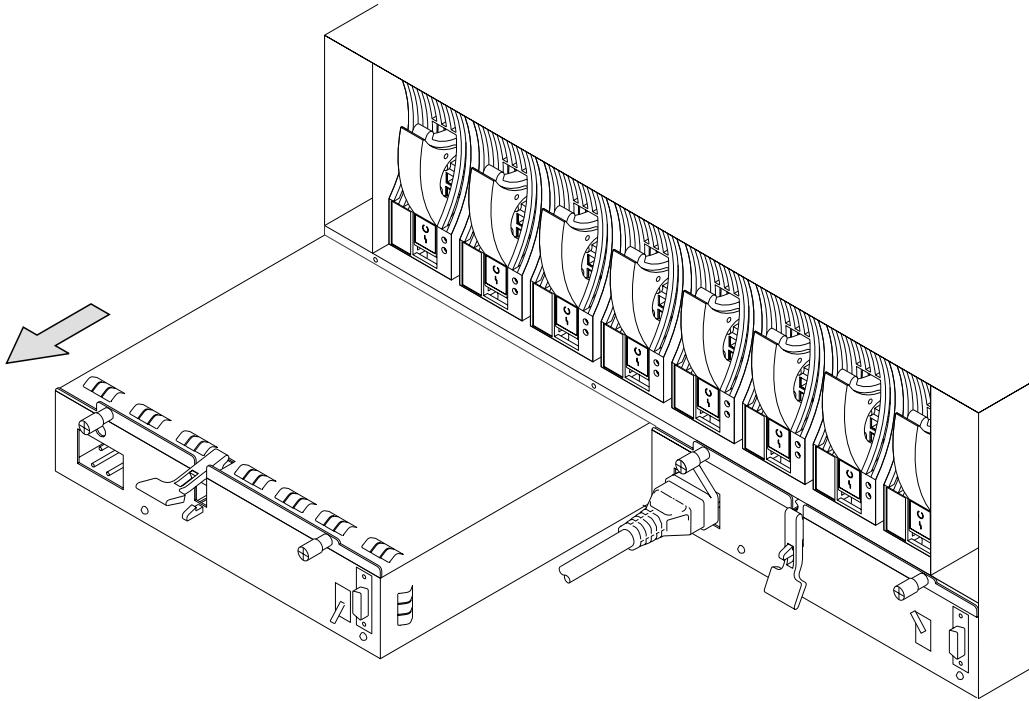
Figure 87. Removing the Power Supply Assembly

Step 11.   Remove the power supply assembly.

The power supply assembly is a complete FRU. Do not try to repair or exchange any part of it.

Note: For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

DANGER

Do not try to open the covers of the power supply assembly.

Installing a Power Supply Assembly

Step 1. **Attention:** Both power supply assemblies in a 7133 must be of the same voltage rating. ***Do not mix power supply assemblies of different voltage ratings.***

Ensure that you are installing a power supply assembly of the correct voltage rating.

Step 2. Refer to Figure 88.
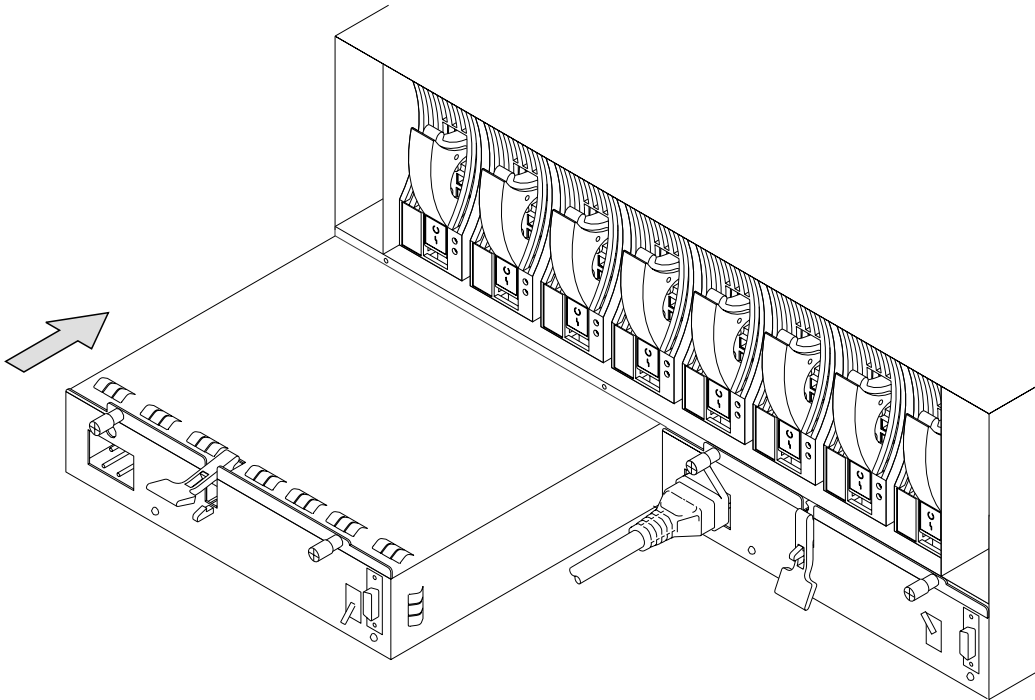
Figure 88. Inserting the Power Supply Assembly

Step 3. Push the power supply assembly into its housing. The assembly stops before it is fully home.

Step 4.   Refer to Figure 89.
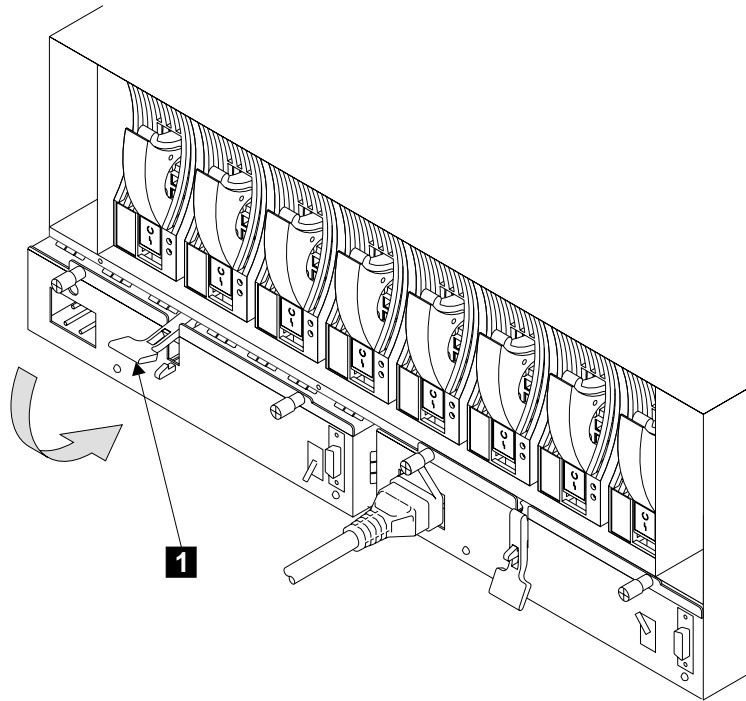
Figure 89. Pushing the Power Supply Assembly Fully Home

Step 5.   Push the lever **1** fully downward. This action pushes the power supply
          assembly home

Step 6.   Refer to Figure 90.
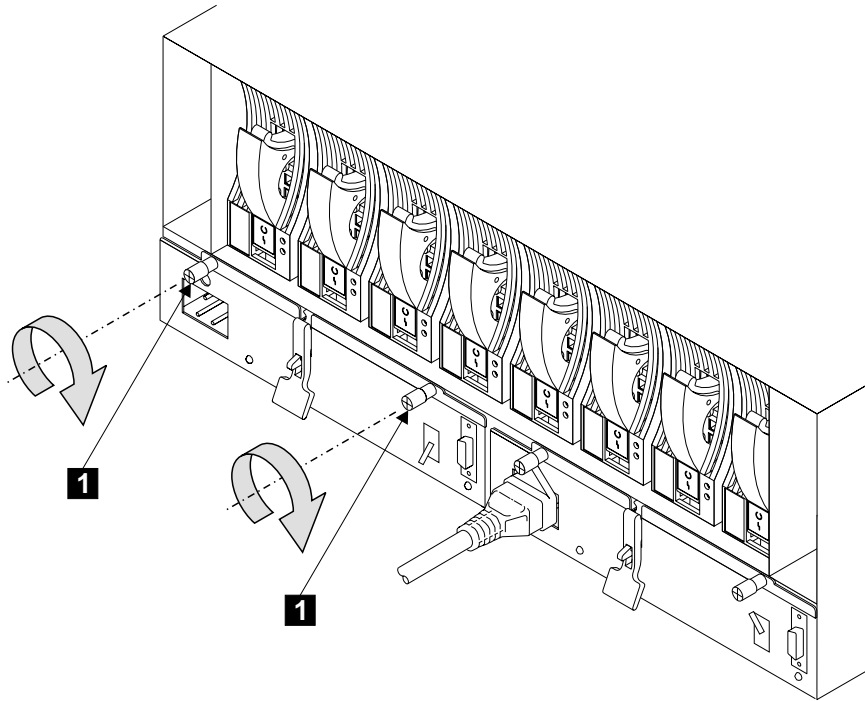
Figure 90. Tightening the Thumbscrews

Step 7.   Tighten the thumbscrews 1 .

Step 8. Refer to Figure 91.
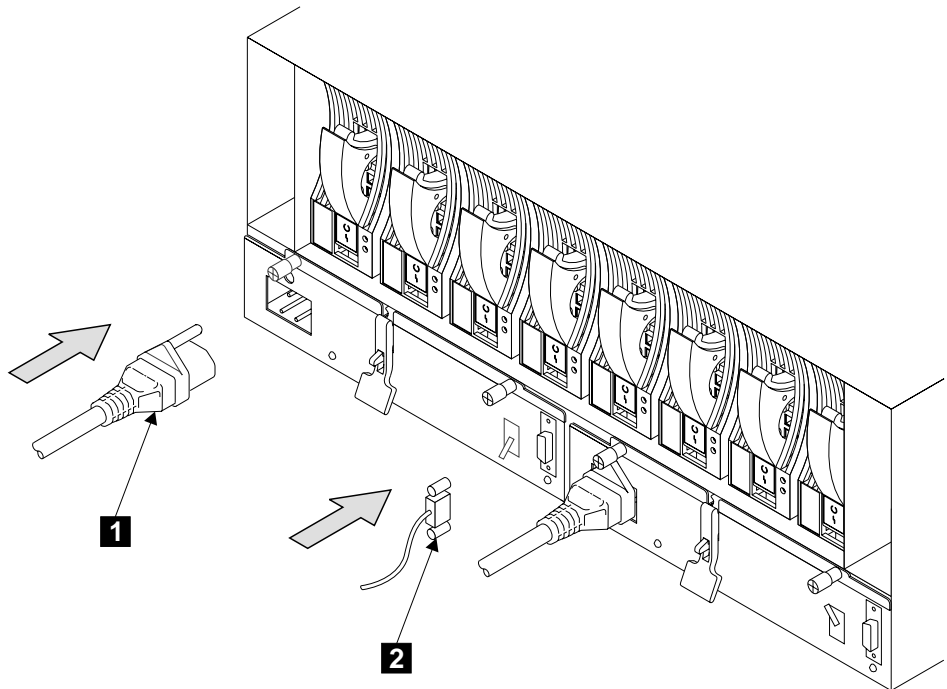
Figure 91. Installing the Cables

Step 9. Install the power cable **1** and, if present, the 7133 power-control cable **2**.

Notes:

   a. When present, the 7133 power-control cable is plugged into the power
      supply assembly that is in position 1 (see "Parts Locations" on page 17).

   b. On a −48 volt 7133 Model D40, ensure that one power supply assembly is
      connected to power source A in the rack, and that the other is connected
      to power source B (see the *7133 Model D40 Serial Disk System:
      Installation Guide* for details).

Step 10. Refer to Figure 92.
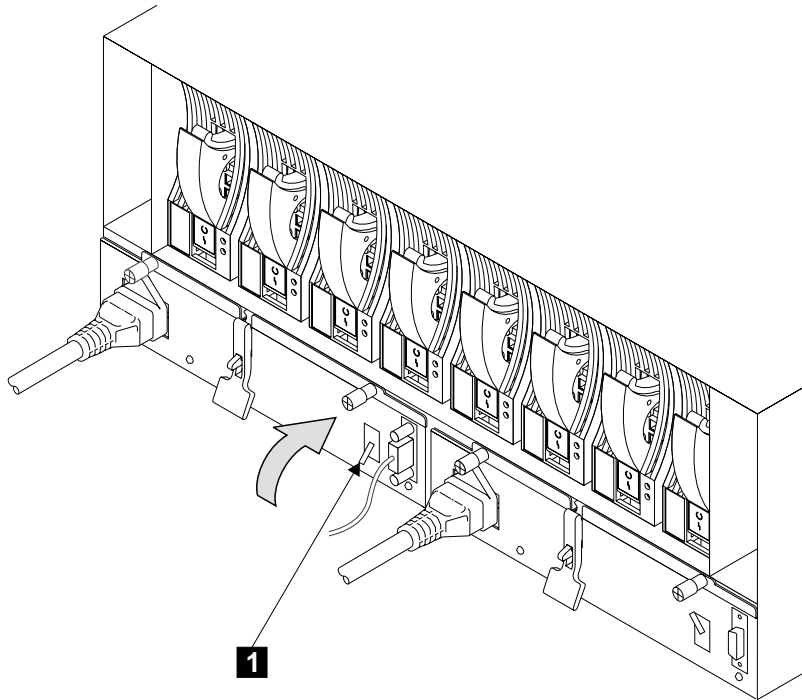
Figure 92. Switching On the Power Supply Assembly

Step 11. Switch on the power supply assembly. To do this, push PWR/FAULT RESET switch **1** upward.

Notes:

a. On early power supply assemblies, pull the switch outward, then push it upward.

b. You might hear the speed of the fans decrease.

Fan Assemblies

Attention: If you are servicing the 7133 under concurrent maintenance (see "Concurrent Maintenance" on page 137), ensure that you have only one fan assembly removed from the 7133 at any time.

Notes:

1. Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing or installing fan assemblies.
2. The diagrams in these instructions show a 7133 Model D40. The procedure for a 7133 Model T40 is the same, except that everything is turned through 90 degrees.

Step 1.   Refer to Figure 93.
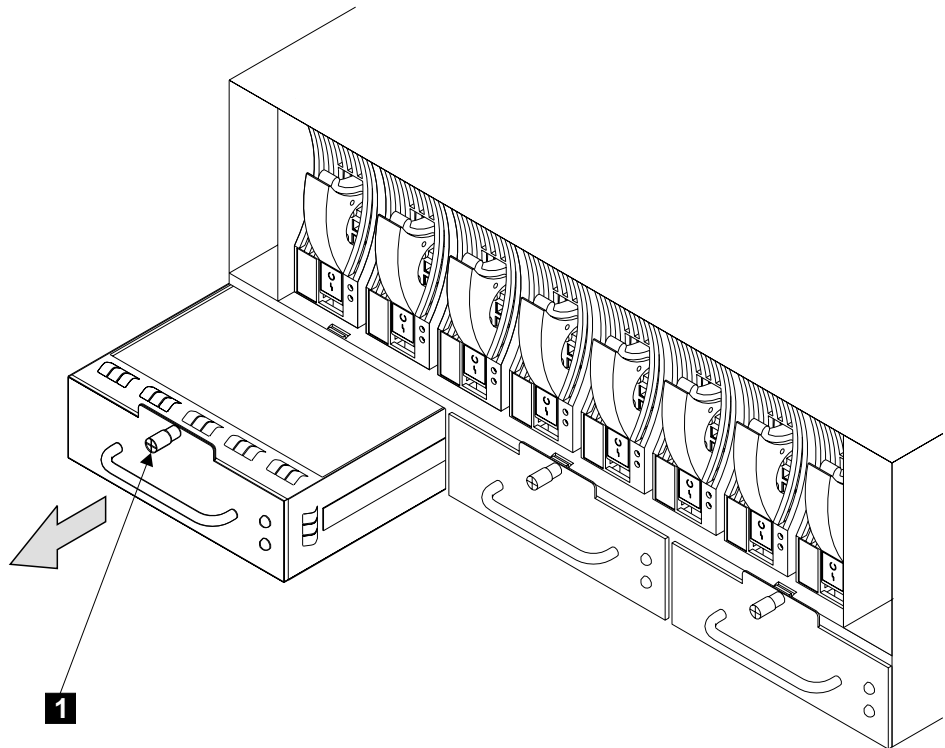
Figure 93. Removing a Fan Assembly

Step 2.   At the front of the 7133, unscrew the thumbscrew **1** of the fan assembly that you are going to remove.

Step 3.   Pull out the assembly.

Note: You might hear the speed of the other fans increase.

The fan assembly is a complete FRU. Do not try to repair or exchange any part of it.

Step 4. Replace parts in the reverse sequence.

> **Note:** When you insert the fan assembly, you might hear the speed of the other fans decrease.

Operator Panel and Disk Drive Status Light Assemblies, Flexible Circuits, and Front Bezel Assembly

The subsections in this section describe removal and replacement procedures for:

- ESD cover (Model D40). You must remove the ESD cover to gain access to:
  - Operator panel assembly (Model D40).
  - Operator panel flexible circuit (Model D40).
  - Disk drive status light assembly (Model D40).
- Front Bezel Assembly (Model T40).
- Operator panel assembly (Model T40).
- Operator panel flexible circuit (Model T40).
- Disk drive status light assembly (Model T40).

Go to the appropriate subsection.

ESD Cover (Model D40)

Note: Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing or installing the operator panel assembly.

Step 1. If not already done, open the front cover (see "Covers" on page 138).

Step 2. Refer to Figure 94.
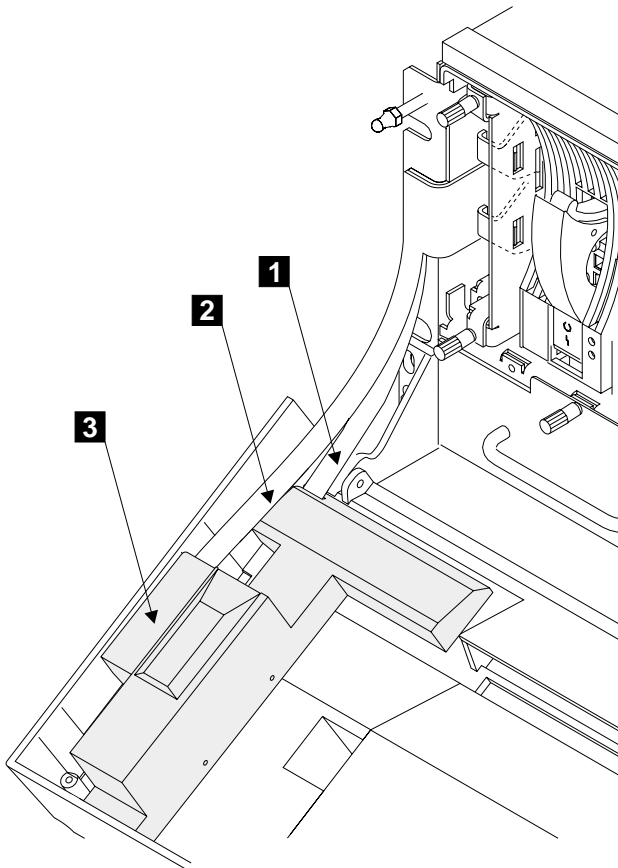
Figure 94. Removing the ESD Cover from a Model D40

Step 3. Slide the electrostatic discharge (ESD) cover **3** forward until it disengages from the operator panel assembly.

Step 4. Carefully lift the ESD cover upward. Note that the operator panel flexible circuit **2** and the disk drive status light flexible circuit **1** are engaged in the slots of the ESD cover.

Step 5. Carefully disengage the two flexible circuits from the slots in the ESD cover.

Step 6. Remove the ESD cover.

Step 7. Replace parts in the reverse sequence.

> **Note:** Engage the two flexible circuits into the slots of the ESD cover before you lower the cover into position.

Operator Panel Assembly (Model D40)

> **Note:** Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing or installing the operator panel assembly.

Step 1. If not already done, open the front cover (see "Covers" on page 138).

Step 2. Remove the ESD cover (see "ESD Cover (Model D40)" on page 176).

Step 3. Refer to Figure 95.
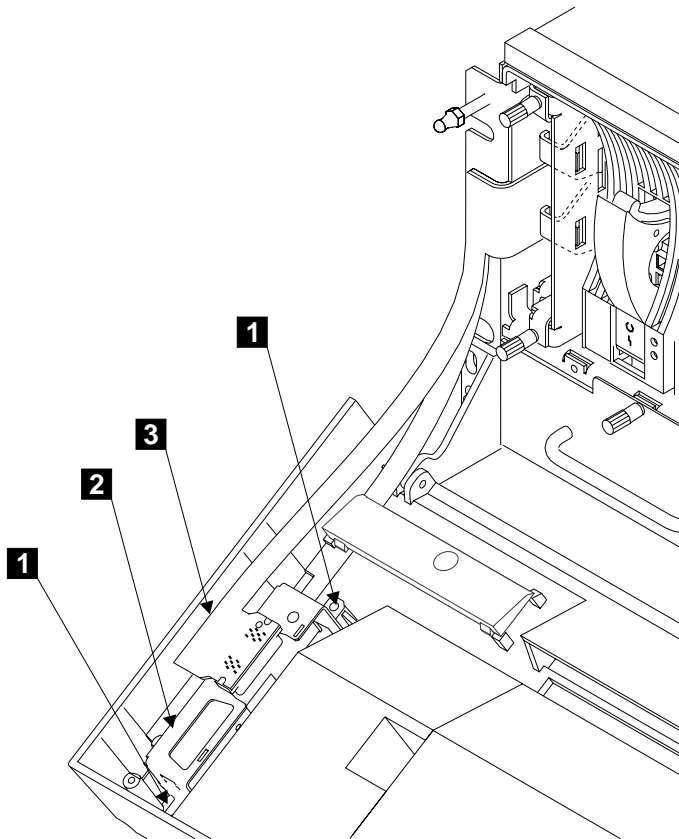
Figure 95. Removing the Operator Panel from a Model D40

Step 4. Unplug the flexible circuit **3** from the operator panel.

> **Note:** If mainline electrical power is present in the 7133, and the 7133 power is set to Standby by the power switch or by the remote-power-control unit, the internal dc power switches on when the flexible circuit is disconnected from the operator panel. The dc power remains switched on when the circuit is reconnected.

Step 5. Unscrew the screws **1** .

Step 6. Pull off the operator panel assembly **2** .

Step 7. Replace parts in the reverse sequence.

Operator Panel Flexible Circuit (Model D40)

Note: Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing or installing the operator panel flexible circuit.

Step 1. If not already done, open the front cover (see "Covers" on page 138).

Step 2. Remove the ESD cover (see "ESD Cover (Model D40)" on page 176).

Step 3. Refer to Figure 96.
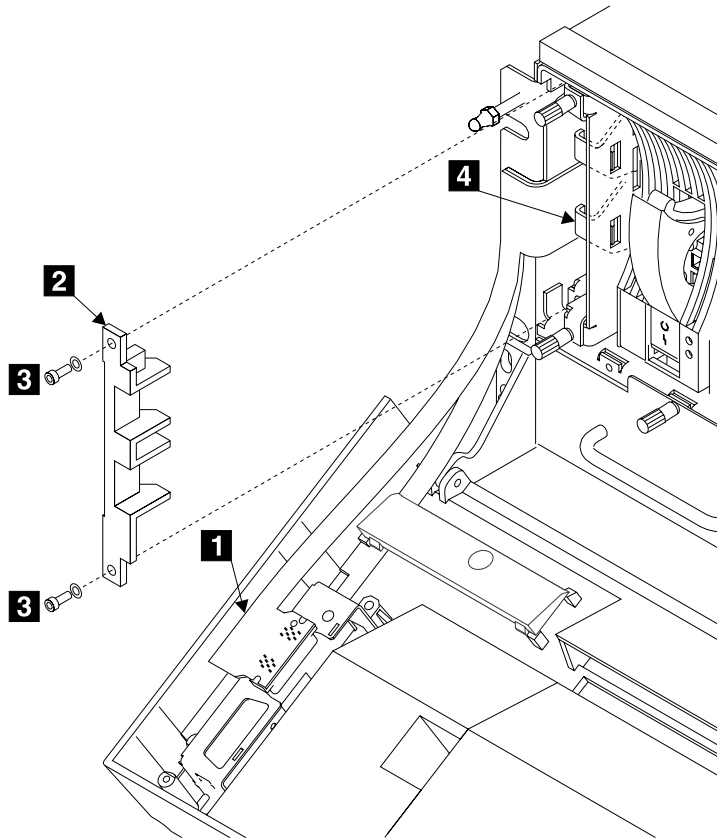
Figure 96. Removing the Operator Panel Flexible Circuit from a Model D40

Step 4. Unplug the flexible circuit **1** from the operator panel.

Note: If mainline electrical power is present in the 7133, and the 7133 power is set to Standby by the power switch or by the remote-power-control unit, the internal dc power switches on when the flexible circuit is disconnected from the operator panel. The dc power remains switched on when the circuit is reconnected.

Step 5. If a latch retainer **2** is present, remove the two screws **3** and the latch retainer.

Step 6. Move the latch **4** to your left, then pull it forward to unplug the operator panel flexible circuit from the controller card assembly.

Step 7. Replace parts in the reverse sequence.

> **Note:** Ensure that the latch of the operator panel flexible circuit engages fully in the slot of the 7133 frame assembly.

Disk Drive Status Lights Assembly (Model D40)

Note: Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing or installing the disk drive status lights assembly or the flexible circuit.

Step 1. If not already done, open the front cover (see "Covers" on page 138).

Step 2. Remove the ESD cover (see "ESD Cover (Model D40)" on page 176).

Step 3. Refer to Figure 97.
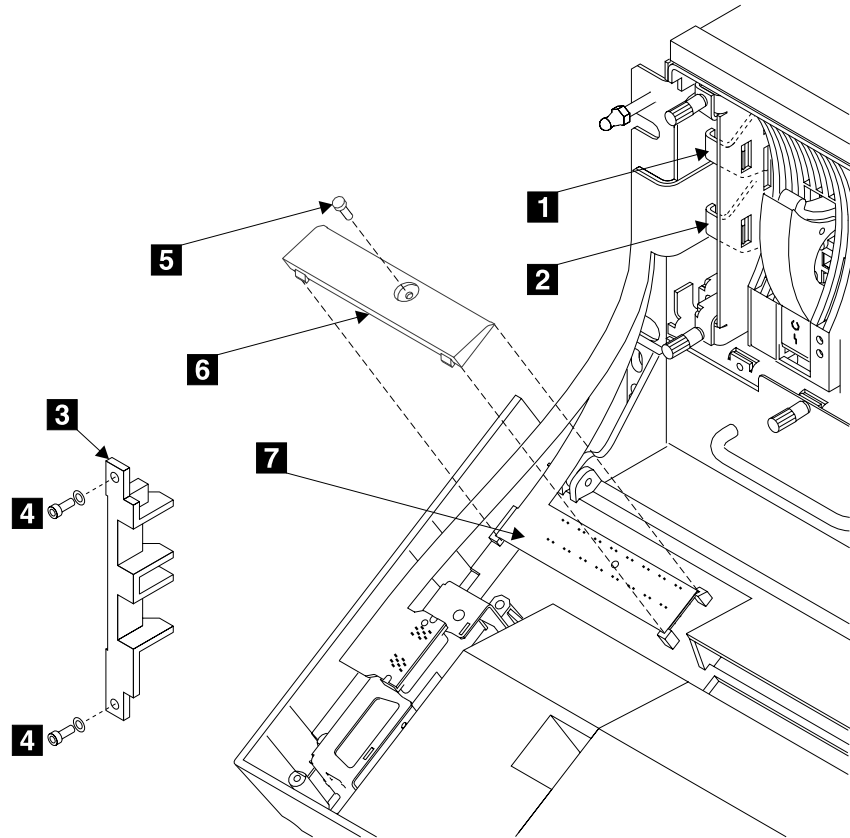
Figure 97. Removing the Disk Drive Status Lights Assembly from a Model D40

Step 4. If a latch retainer **3** is present, remove the two screws **4** and the latch retainer.

Step 5. Move the latch **2** to your left, then pull it forward to unplug the operator panel flexible circuit from the controller card assembly.

> **Note:** If mainline electrical power is present in the 7133, and the 7133 power is set to Standby by the power switch or by the remote-power-control unit, the internal dc power switches on when the operator panel flexible

circuit is disconnected from the controller card assembly. The dc power remains switched on when the circuit is reconnected.

Step 6.   Do the same actions with the latch **1** to unplug the disk drive status lights flexible circuit from the controller card assembly.

Step 7.   Unscrew the screw **5** .

Step 8.   Remove the LED-cable cover **6** and the disk drive status lights assembly **7** .

Step 9.   Replace parts in the reverse sequence.

> **Note:** Ensure that the latches of the operator panel flexible circuit and the disk drive status lights flexible circuit engage fully in the slots of the 7133 frame assembly.

Front Bezel Assembly (Model T40)

Step 1. Verify with the customer that all operations between the 7133 and the using system have been stopped.

Step 2. If not already done, open the front cover (see "Covers" on page 138).

Step 3. Refer to Figure 98.
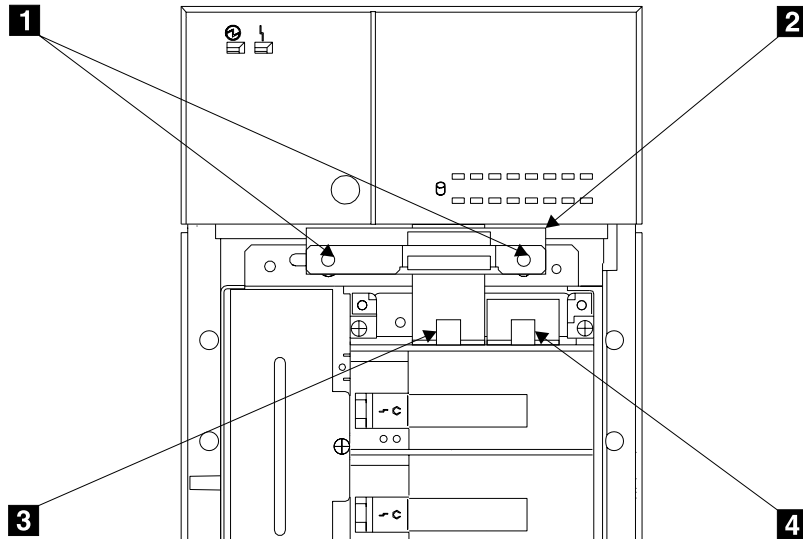
Figure 98. Disconnecting the Flexible Circuits

Step 4. Remove the two front mounting screws **1** and the RFI bracket **2** .

Step 5. Move the latch **3** upward, then pull it forward to unplug the operator panel flexible circuit from the controller card assembly.

Step 6. Do the same actions with the latch **4** to unplug the disk drive status lights flexible circuit from the controller card assembly.

Step 7.   Refer to Figure 99.
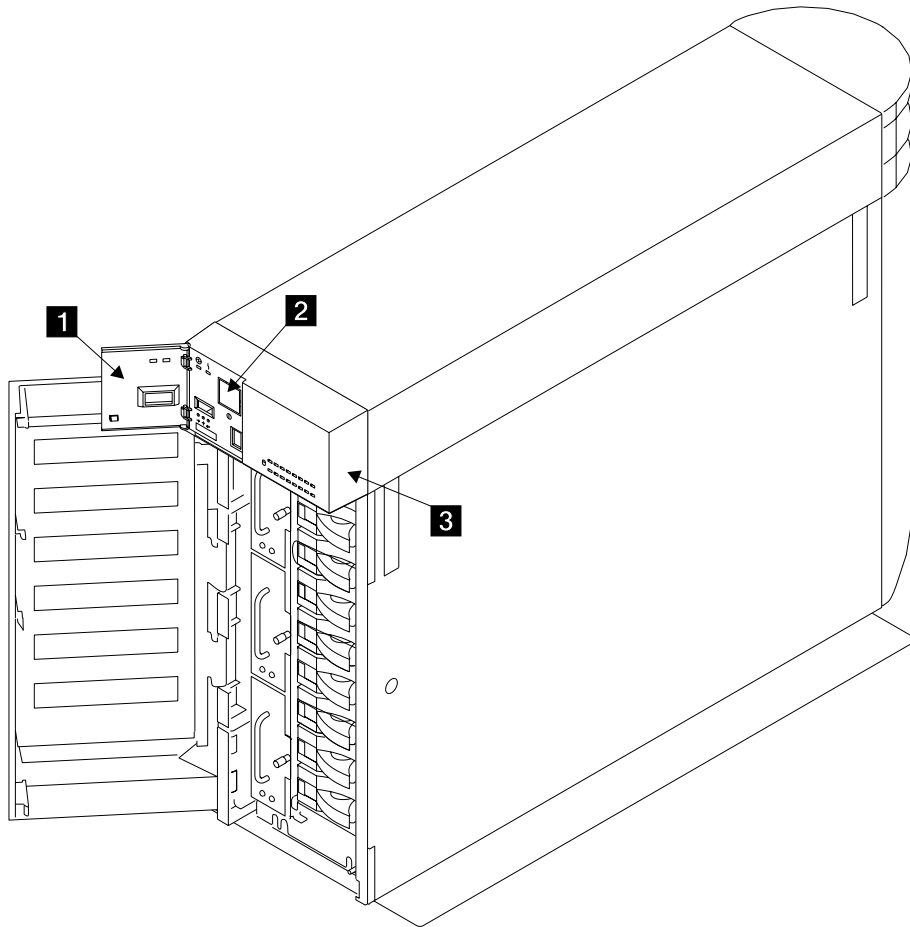
Figure 99. Checking the Front Bezel Assembly

Step 8.   Open the operator panel flap **1** .

Step 9.   Holding the bezel assembly **3** with both hands, press its bottom surface upward to release its clips.

Step 10.   Rotate the bezel assembly slightly upward. As you do this, note whether the power switch **2** moves with the bezel assembly; that is, whether the power switch is attached to the bezel assembly.

   • If the switch moves with the bezel assembly, you have an early-type bezel assembly. Clip the bezel assembly back into position, then go to step 11 on page 185.

   Note: Early-type bezel assemblies are no longer available. If you are going to exchange this early-type bezel assembly for a new one,

you must install the later type. You must also exchange the power switch and cable assembly for the later type. Ensure that you have the correct power switch and cable assembly available.

- If the switch remains in position (that is, the power switch is not attached to the bezel assembly), you have a later-type bezel assembly. Carefully lift the bezel assembly and its attached flexible circuits away from the 7133.

Step 11. If not already done, open the back cover (see "Covers" on page 138).

Step 12. Remove all power from the 7133 (see "Power (Model T40)" on page 148).

Step 13. Refer to Figure 100.
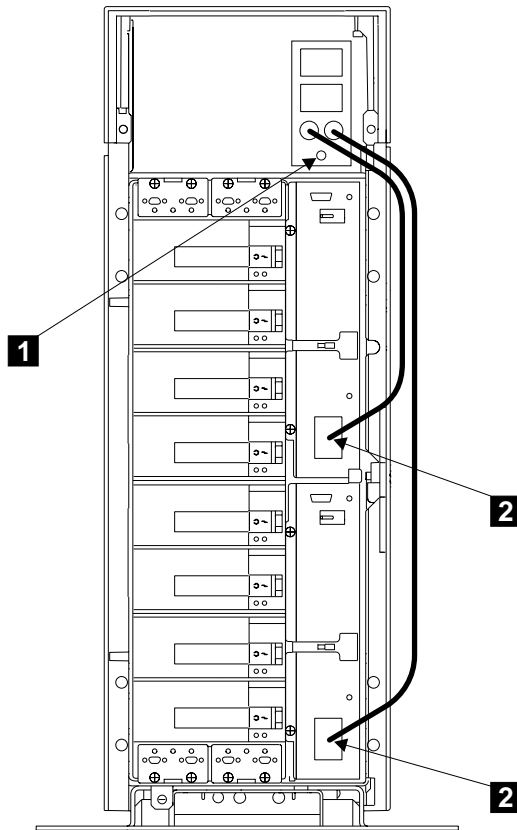
Figure 100. Removing the AC Connector Block

Step 14. Unplug the two power cables **2** from the power supply assemblies.

Step 15. Remove the screw **1** from the AC connector block.

Step 16. Lift the AC connector block and turn it counterclockwise to remove it from its mounting lug.

Step 17. Place the AC connector block and its attached power cables onto the flat surface inside the 7133.

Chapter 3. Removal and Replacement Procedures **185**

Step 18. Go to the front of the 7133.

Step 19. If not already done, open the front cover (see "Covers" on page 138).

Step 20. Refer to Figure 101.
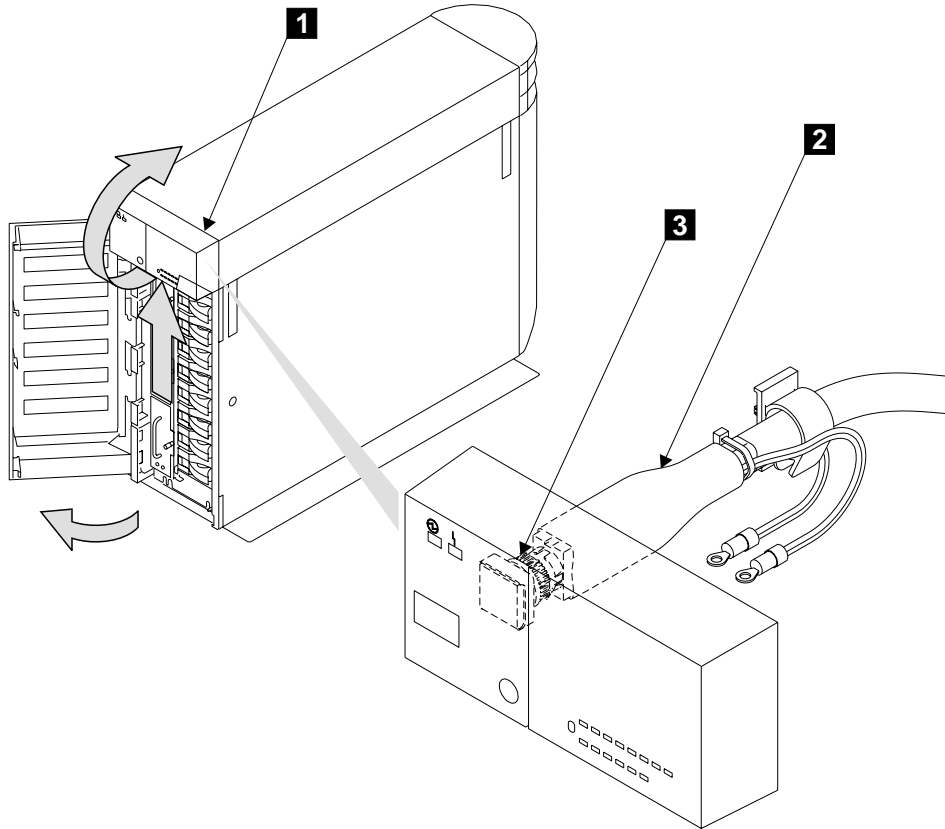
Figure 101. Removing an Early-Type Front Bezel Assembly

Step 21. Close the operator panel flap (if open) to prevent it from becoming damaged.

Step 22. Holding the bezel assembly **1** with both hands, press its bottom surface upward to release its clips.

Step 23. Rotate the bezel assembly slightly upward, and lift it over the edge of the 7133 frame. Carefully pull the bezel assembly approximately 15 cm (6 in.) away from the 7133.

Step 24. **Attention:** To prevent damage to the switch assembly and power cable, ensure that you keep the power cable in line with the power switch assembly as you disconnect it.

Disconnect the power cable assembly **2** by pulling it away from the power switch assembly **3** .

Step 25. Remove the bezel assembly.

Step 26. If you are exchanging the bezel assembly, you must install the later-type bezel and the later-type power switch and cable assembly. Go to "Converting from Early- to Later-Type Bezel Assembly and Power Switch and Cable Assembly" on page 195.

If you are reinstalling the original bezel, replace parts in the reverse sequence.

Notes:

a. Reconnect the operator panel flexible circuit and the disk drive status lights flexible circuit to the controller card before you reinstall the RFI bracket.

b. Ensure that the latches of the operator panel flexible circuit and the disk drive status lights flexible circuit engage fully in the slots of the 7133 frame assembly.

c. Do not forget to reinstall the RFI bracket. This bracket prevents radio frequency interference.

d. When connecting the power cable assembly to the bezel assembly, carefully align the two connectors, then press in the cable strongly until you hear a click.

Operator Panel Assembly and Operator Panel Flexible Circuit (Model T40)

Step 1. If not already done, open the front cover (see "Covers" on page 138).

Step 2. Remove the front bezel assembly (see "Front Bezel Assembly (Model T40)" on page 183).

Step 3. Refer to Figure 102.
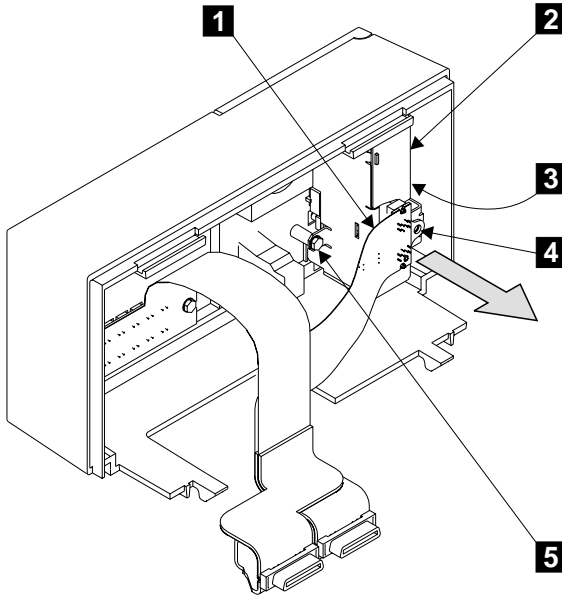
Figure 102. Removing the Operator Panel Flexible Circuit and the Operator Panel from a Model T40

Step 4. Unscrew the screw **4** .

Step 5. Unplug the flexible circuit **1** from the operator panel.

Step 6. Unscrew the screws **3** and **5** .

Step 7. Remove the operator panel assembly **2** .

Step 8. Replace parts in the reverse sequence.

> **Note:** Ensure that the latches of the operator panel flexible circuit and the disk drive status lights flexible circuit engage fully in the slots of the 7133 frame assembly.

Disk Drive Status Lights Assembly (Model T40)

Step 1. If not already done, open the front cover (see "Covers" on page 138).

Step 2. Remove the front bezel assembly (see "Front Bezel Assembly (Model T40)" on page 183).

Step 3. Refer to Figure 103.
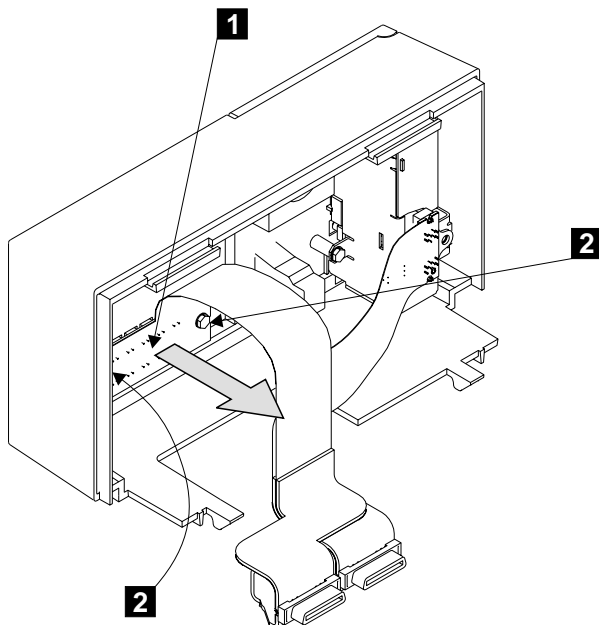
Figure 103. Removing the Disk Drive Status Lights Assembly from a Model T40

Step 4. Unscrew the screws **2** .

Step 5. Remove the disk drive status lights assembly **1** .

Step 6. Replace parts in the reverse sequence.

> **Note:** Ensure that the latches of the operator panel flexible circuit and the disk drive status lights flexible circuit engage fully in the slots of the 7133 frame assembly.

Power Switch and Cable Assembly (Model T40)

Attention: The power switch and cable assembly FRU consists of a power switch and a cable assembly. If you are exchanging the FRU, ensure that you exchange both parts of the FRU.

Step 1. If not already done, open the front cover (see "Covers" on page 138).

Step 2. Remove the front bezel assembly (see "Front Bezel Assembly (Model T40)" on page 183).

Step 3. If the bezel assembly that you have just removed is an early type (see "Front Bezel Assembly (Model T40)" on page 183), go to "Early-Type Power Switch and Cable Assembly" on page 191.

If the bezel assembly that you have just removed is a later type, go to "Later-Type Power Switch and Cable Assembly" on page 193.

Early-Type Power Switch and Cable Assembly

Step 1. Refer to Figure 104.
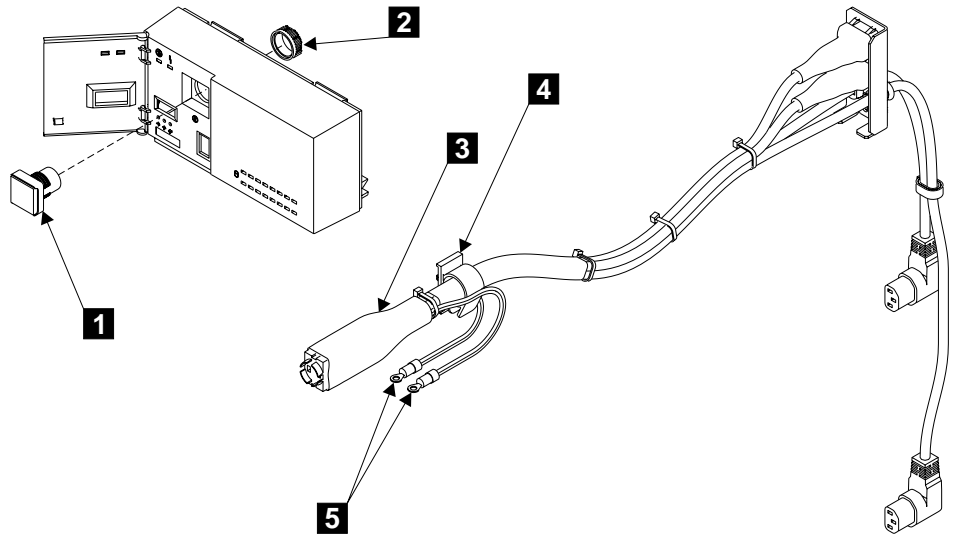
Figure 104. Removing an Early-Type Power Switch and Cable Assembly

Step 2. Remove the two nuts **5** to release the grounding wires.

Step 3. Release the cable from the clip **4** .

Step 4. Pull the power cable assembly **3** out through the front of the 7133.

Step 5. Open the operator panel flap on the front bezel assembly.

Step 6. Unscrew the retaining ring **2** . Be careful that you do not damage the flexible circuits that are inside the bezel assembly.

Step 7. Remove the power switch assembly **1** from the bezel assembly.

Step 8. If you are exchanging the front bezel for a new one, the new bezel will be of the later type. (The early-type bezel is no longer available.) You will need, therefore, to exchange this early-type power switch and cable assembly for a later-type assembly. Go to "Converting from Early- to Later-Type Bezel Assembly and Power Switch and Cable Assembly" on page 195.

If you are reinstalling the original power switch and cable assembly, or you are exchanging the power switch and cable assembly for one of the same type, replace parts in the reverse sequence.

Notes:

a. When reinstalling an early-type power switch assembly:

1) Ensure that the orientation mark on the top of the assembly is aligned with the notch in the face of the bezel assembly.

2) Install the retaining ring, and tighten it until finger-tight. Be careful that you do not damage the flexible circuits that are inside the bezel assembly.

b. Ensure that the latches of the operator panel flexible circuit and the disk drive status lights flexible circuit engage fully in the slots of the 7133 frame assembly.

Later-Type Power Switch and Cable Assembly

Step 1. If not already done, open the back cover (see "Covers" on page 138).

Step 2. Remove all power from the 7133 (see "Power (Model T40)" on page 148).

Step 3. Refer to Figure 105.
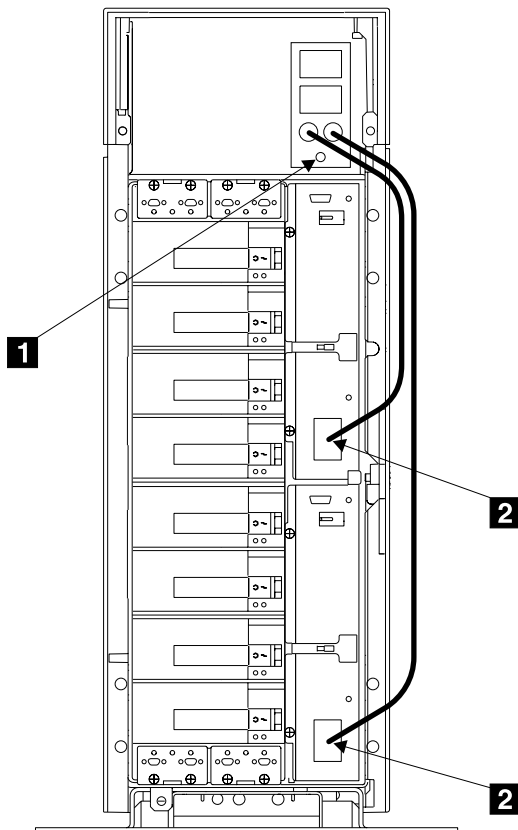
Figure 105. Removing the AC Connector Block

Step 4. Unplug the two power cables **2** from the power supply assemblies.

Step 5. Remove the screw **1** from the AC connector block.

Step 6. Lift the AC connector block and turn it counterclockwise to remove it from its mounting lug.

Step 7. Place the AC connector block and its attached power cables onto the flat surface inside the 7133.

Step 8. Go to the front of the 7133.

Step 9. If not already done, open the front cover (see "Covers" on page 138).

Step 10. Remove the front bezel assembly (see "Front Bezel Assembly (Model T40)" on page 183).

Step 11.   Refer to Figure 106.
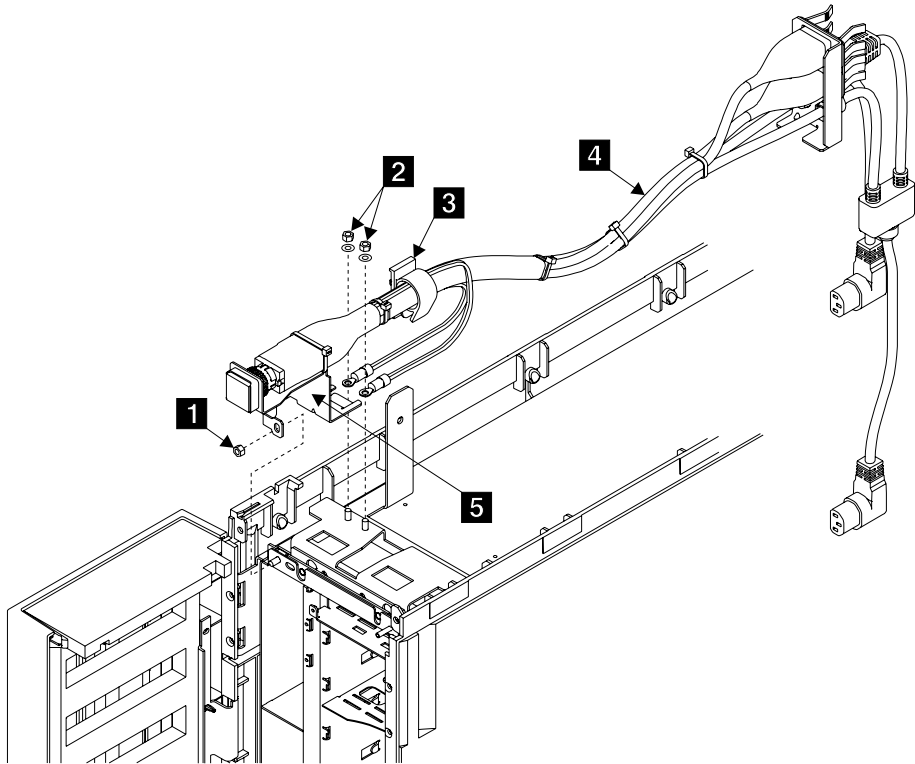
Figure 106. Removing a Later-Type Power Switch and Cable Assembly

Step 12.   Remove the two nuts **2** to release the grounding wires.

Step 13.   Release the cable from the clip **3** .

Step 14.   Remove the nut **1** .

Step 15.   Pull the mounting bracket **5** forward to remove it from the top support of the 7133 frame assembly.

Step 16.   Pull the power cable assembly **4** out through the front of the 7133.

Step 17.   Replace parts in the reverse sequence.

Notes:

a. When installing the mounting bracket, insert the lug of the bracket into the hole in the top support of the frame assembly. Slide the bracket toward the back of the 7133 so that the lug goes under the top support, and the horizontal legs of the bracket rest on top of the support.

b. Ensure that the latches of the operator panel flexible circuit and the disk drive status lights flexible circuit engage fully in the slots of the 7133 frame assembly.

Converting from Early- to Later-Type Bezel Assembly and Power Switch and Cable Assembly

Step 1. If not already removed, remove the early-type bezel assembly (see "Front Bezel Assembly (Model T40)" on page 183) and power switch and cable assembly (see "Power Switch and Cable Assembly (Model T40)" on page 190).

Step 2. Refer to Figure 107.
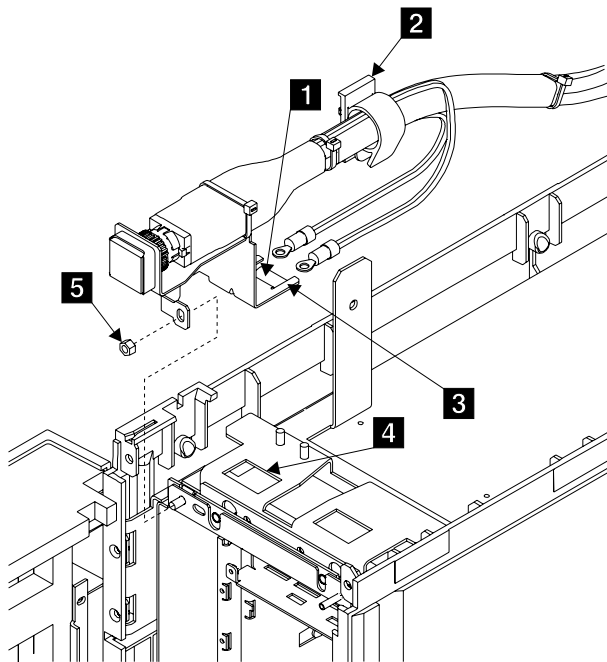
Figure 107. Installing the Later-Type Power Switch and Cable Assembly

Step 3. Feed the new power switch and cable assembly into the front of the 7133.

Step 4. Insert the lug **1** of the mounting bracket into the hole **4** in the top support of the frame assembly. Slide the bracket toward the back of the 7133 so that the lug goes under the top support, and the horizontal legs **3** of the bracket rest on top of the support .

Step 5. Put the power cable into the clip **2** , then close the clip.

Step 6. Install and tighten the nut **5** .

Step 7. Refer to Figure 108.
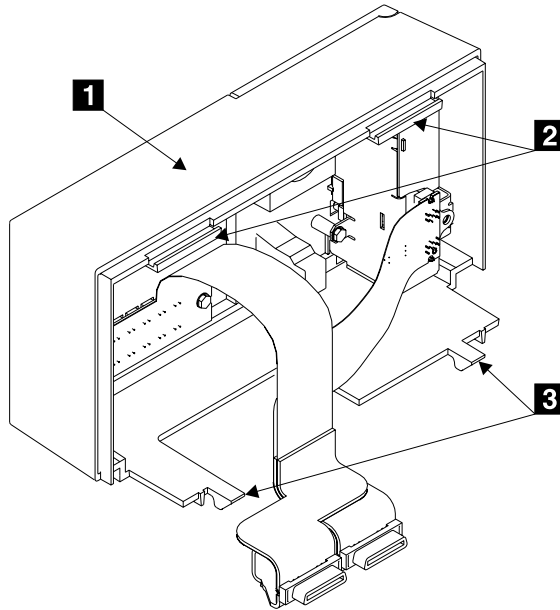
Figure 108. Installing the Later-Type Bezel

Step 8. Holding the bezel assembly **1** with both hands, engage the hooks **2** under the front edge of the 7133.

Step 9. Press the bottom surface of the bezel assembly upward to lift the latches **3**, then push the assembly into the 7133.

Step 10. Press on the front of the bezel assembly to ensure that the latches click into position.

Step 11. Refer to Figure 109.
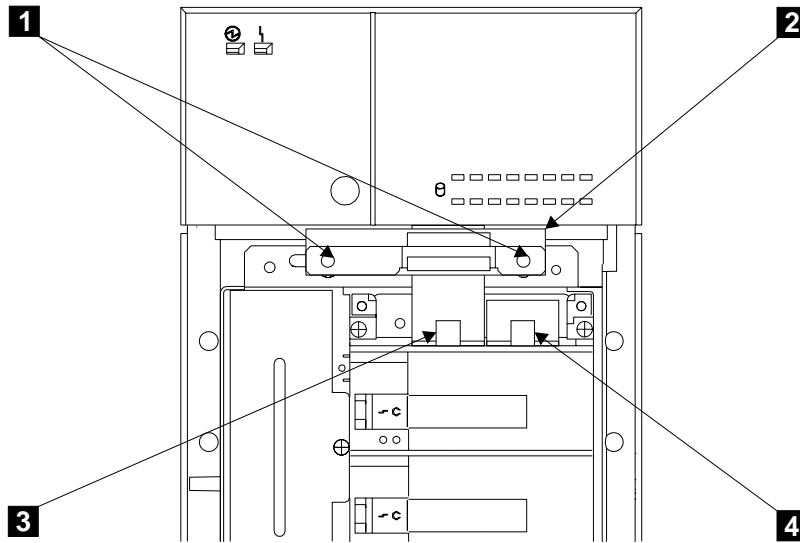
Figure 109. Reconnecting the Flexible Circuits and RFI Bracket

Step 12. Reconnect the operator panel flexible circuit **3** and the disk drive status lights flexible circuit **4** .

Step 13. Ensure that the latches of the two flexible circuits engage fully in the slots of the 7133 frame assembly.

Step 14. Go to the back of the 7133.

Step 15. If not already done, open the back cover (see "Covers" on page 138).

Step 16.   Refer to Figure 110.
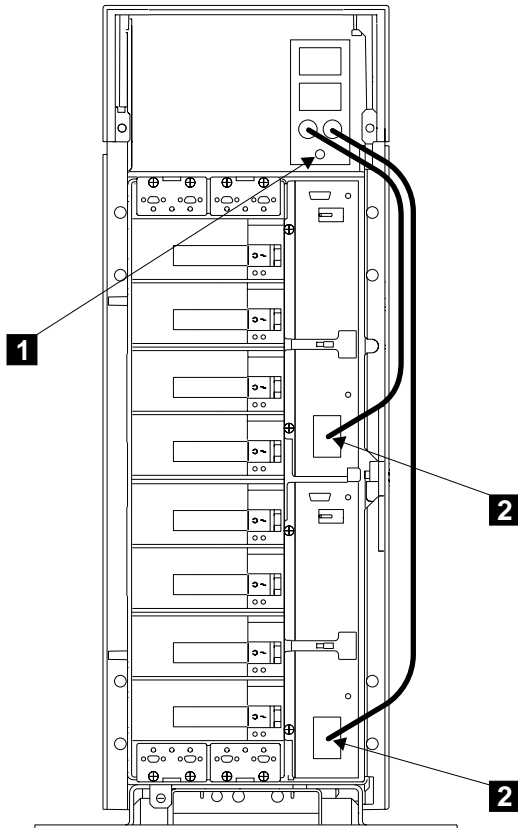
Figure 110. Reinstalling the AC Connector Block and Power Cables

Step 17.   Place the AC connector block into position on its mounting lug.

Step 18.   Install the screw **1** .

Step 19.   Plug the two power cables **2** into the power supply assemblies.

Controller Card Assembly

Attention: The controller card is electrostatic-discharge (ESD) sensitive. Use the tools and procedures defined by your organization to protect such parts.

Notes:

1. Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing or installing the controller card assembly.

2. The diagrams in these instructions show a 7133 Model D40. The procedure for a 7133 Model T40 is the same, except that everything is turned through 90 degrees.

Step 1.   Open the front cover (see "Covers" on page 138).

Step 2.   Refer to Figure 111
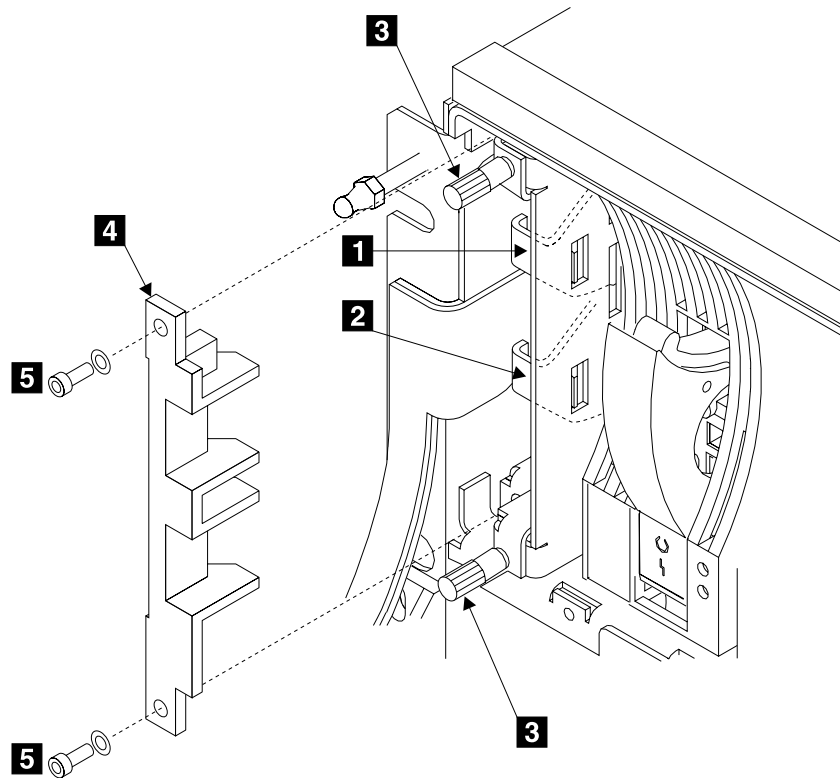
Figure 111. Removing the Controller Card Assembly

Step 3.   If a latch retainer **4** is present, remove the two screws **5** and the latch retainer.

Step 4.   Move the latch **2** to your left (Model D40) or upward (Model T40), then pull it forward to unplug the operator panel flexible circuit from the controller card assembly.

> **Note:** If mainline electrical power is present in the 7133, and the 7133 power is set to Standby by the power switch (Model D40 only) or by the remote-power-control unit (both models), the internal dc power switches on when the operator panel flexible circuit is disconnected from the controller card assembly. The dc power remains switched on when the circuit is reconnected.

Step 5. Do the same actions with the latch **1** to unplug the disk drive status lights flexible circuit from the controller card assembly.

Step 6. Unscrew the two thumbscrews **3** .

Step 7. Pull the controller card assembly out from the 7133.

> **Note:** If mainline electrical power is present in the 7133, the internal dc power switches on (if previously turned off) when the controller card assembly is removed. The dc power remains switched on when the controller card assembly is reinstalled.

Step 8. Replace parts in the reverse sequence.

> **Notes:**
>
> a. Ensure that the latches of the operator panel flexible circuit and the disk drive status lights flexible circuit engage fully in the slots of the 7133 frame assembly.
>
> b. If you have installed a replacement controller card assembly, you might need to reconfigure the 7133 to the using system (see Configuring a 7133 to the Using System in the "Additional Information" appendix (in this book) for your using system).

Step 9. **Important:** Using the method that is provided on your using system, check the level of microcode that is present on the controller card that you have just installed. Additional information about the latest levels of controller card microcode is given on the web support page (see Web Support Pages in the "Additional Information" appendix (in this book) for your using system). If you need to download the latest microcode, see Controller Card Microcode Maintenance in the "Additional Information" appendix (in this book) for your using system.

Bypass (SNBC) Cards

Attention:

- The bypass cards are electrostatic-discharge (ESD) sensitive. Use the tools and procedures defined by your organization to protect such parts.
- Before you remove a bypass card, check the configuration of the 7133 to find out which disk drive modules are affected by the removal of this particular bypass card. Ensure that all disk drive modules so affected are no longer available to the using system.

Note: Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing or installing a bypass card.

Step 1. Refer to Figure 112.
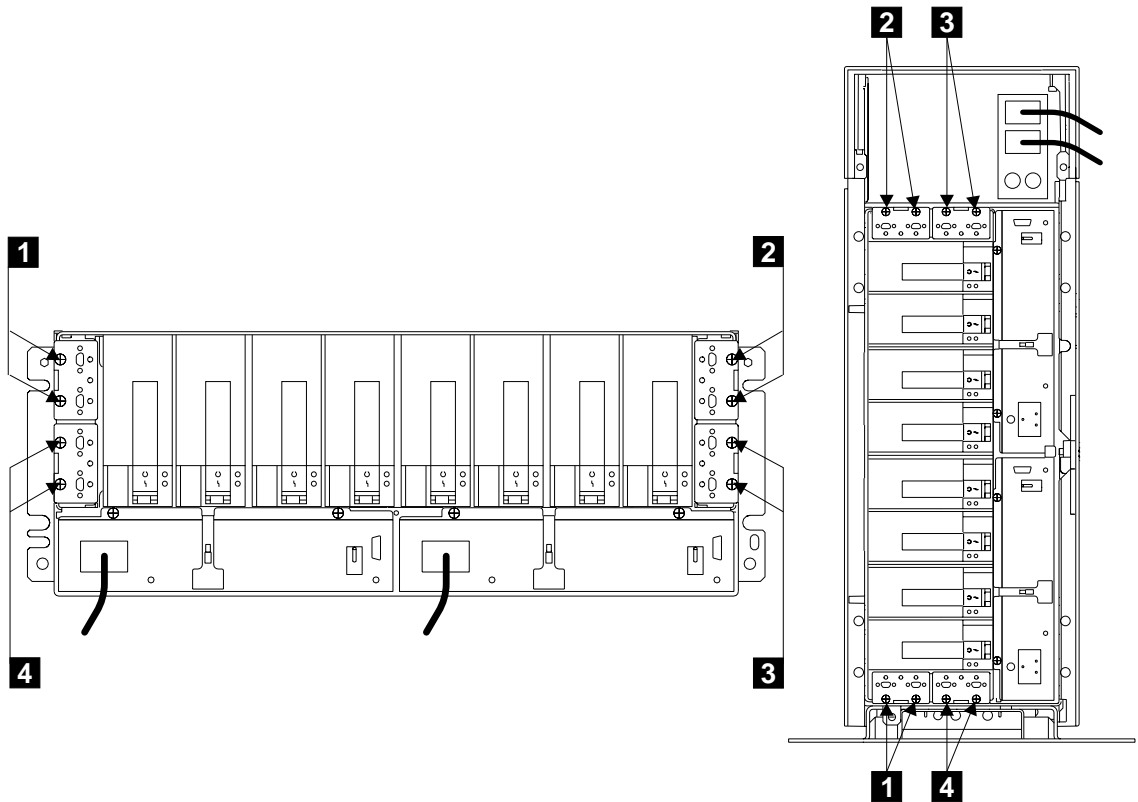
Figure 112. Removing the Bypass Cards

Step 2. If you are removing more than one bypass card, make a note of which SSA cables (if present) are connected to each particular bypass card.

Step 3. Disconnect the external SSA cables (if present) from the card, or cards, that you are going to remove. To prevent damage to the SSA connector screws,

ensure that you use the special screwdriver (SSA tool, part 32H7059) to unscrew them. The screwdriver is supplied with the 7133.

Step 4. Unscrew the thumbscrews **1**, **2**, **3**, or **4** on the card, or cards, that you are going to remove.

Step 5. **Attention:** The four bypass cards might not all have the same jumper settings. It is important, therefore, that they, or their replacement cards, be installed into the correct positions.

If you are removing more than one bypass card, make a note of the positions of those cards before you remove them. Attach labels if necessary.

Step 6. Pull out the card, or cards.

Step 7. If you are now going to install a new bypass card, or change the jumper settings on the card that you have just removed, go to step 8. Otherwise, go to step 14 on page 203.

Step 8. Refer to 113.
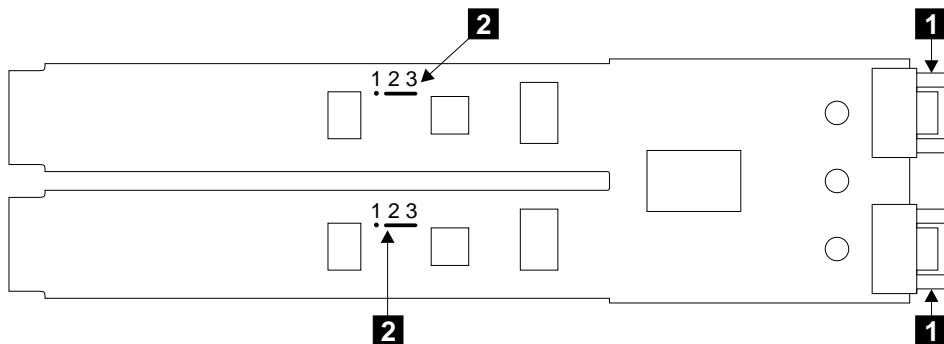
Figure 113. Jumpers Set for Automatic Mode

Step 9. Lay the card down with its electronic components upward and its SSA connectors **1** to your right.

Step 10. Note that in Figure 113, the jumpers are set for **Automatic mode**. That is, the jumpers **2** connect pins 2 and 3.

Note: The default setting of all new bypass cards is for Automatic mode.

In Figure 114 on page 203, the jumpers are set for **Forced Inline mode**. That is, the jumpers **2** connect pins 1 and 2.

Note: When a bypass card is jumpered for Forced Inline mode, its mode light shows green when power is present at the card.
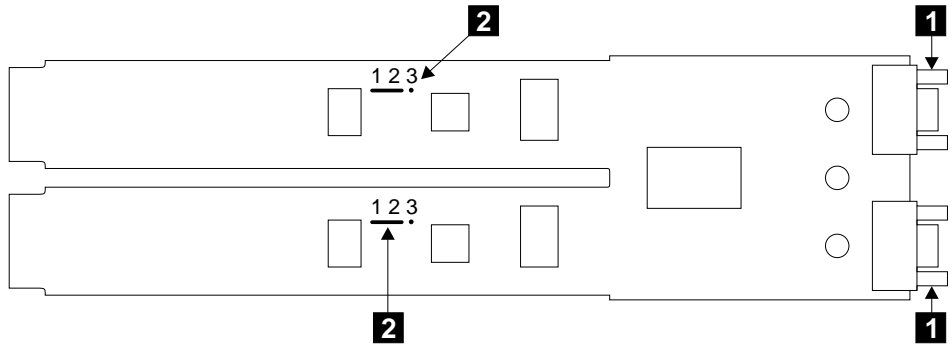
Figure 114. Jumpers Set for Forced Inline Mode

Step 11. If you are installing a new bypass card, go to step 12.

If you are changing the jumper settings of a card that has been operational, go to step 13.

Step 12. Check whether the jumpers on the new card are set for the same mode as are the jumpers on the card that you have just removed.

If it is set for the same mode, you can now install the new bypass card. Go to step 14.

If it is *not* set for the same mode, you must change the positions of the jumpers on the new card. Go to step 13.

Step 13. Remove the jumpers, and install them into the required positions.

Step 14. Replace parts in the reverse sequence. Ensure that you push the cards fully home.

> **Note:** When you reinstall the external SSA cables, ensure that you use the special screwdriver (SSA tool, part 32H7059) to tighten the SSA connector screws.

Remote-Power-On Control Unit

This section has two subsections; one is for Model D40, the other is for Model T40. Go to the appropriate subsection.

Remote-Power-On Control Unit (Model D40)

Note: Unless you have a particular reason to do so, do not switch off the using system or the 7133 when removing or installing the remote-power-on control unit.

Step 1.   Refer to Figure 115.
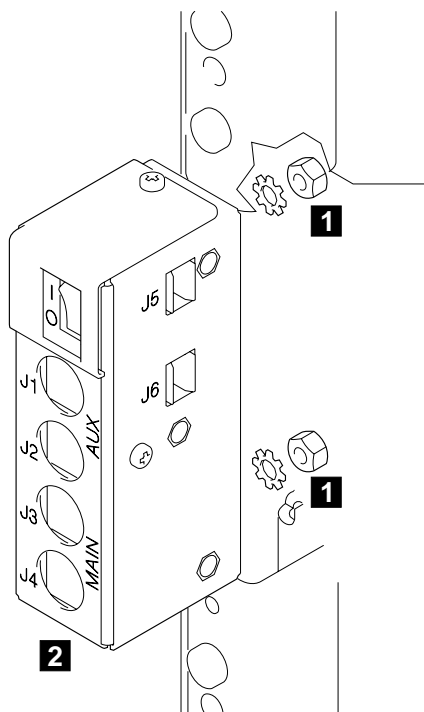
Figure 115. Removing the Remote-Power-On Control Unit from Model D40

Step 2.   At the back of the 7133, note the positions of all the cables that are connected to the remote-power-on control unit.

Step 3.   Remove all cables from the remote-power-on control unit **2** .

> **Note:** If the 7133 is still connected to the mainline power source, and you have not set the 7133 Power switch to Off, the internal dc power switches on (if previously switched off by the using-system power control) when you remove the cables.

Step 4.   Remove the two nuts **1** and their lock washers.

Step 5.   Remove the remote-power-on control unit **2** .

Step 6. Replace parts in the reverse sequence.

> **Note:** If the 7133 remained operational while you removed the
> remote-power-on control unit, ensure that the power switch of the
> remote-power-on control unit that you are going to install is set to **|** (on)
> *before you reinstall any power-control cables.* Otherwise, when you
> install the cables, the internal dc power of the 7133 might switch off.

Remote-Power-On Control Unit (Model T40)

Step 1. Open the back cover (see "Back Cover (Model T40)" on page 144).

Step 2. Refer to Figure 116.
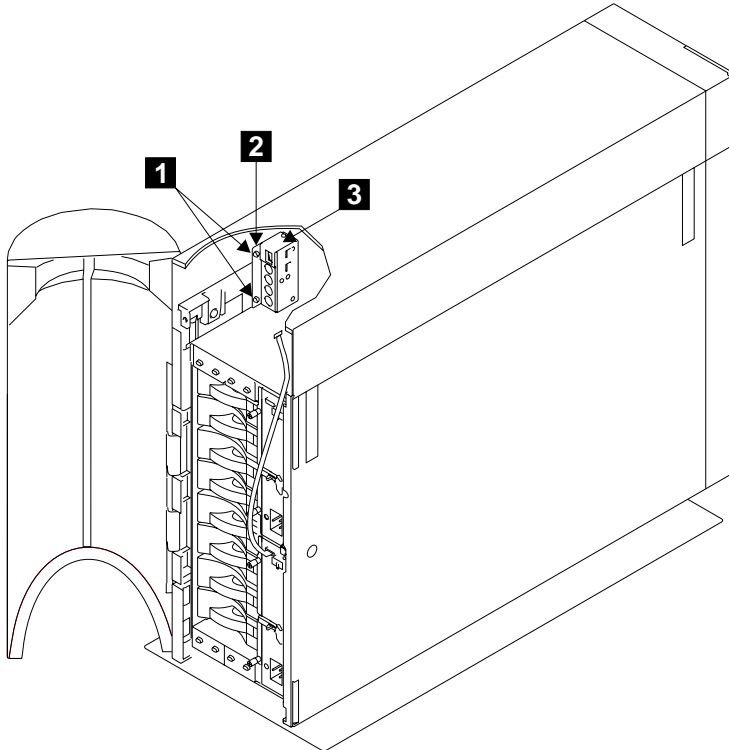
Figure 116. Removing the Remote-Power-On Control Unit from Model T40

Step 3. At the back of the 7133, note the positions of all the cables that are connected to the remote-power-on control unit.

Step 4. Remove all cables from the remote-power-on control unit **3**.

> **Note:** If the 7133 is still connected to the mainline power source, and you have not set the 7133 Power switch to Off, the internal dc power switches on (if previously switched off by the using-system power control) when you remove the cables.

Step 5. Remove the two screws **1** and remove the bracket **2** (with the remote-power-on control unit **3** still attached) from the 7133.

Step 6. Refer to Figure 117.
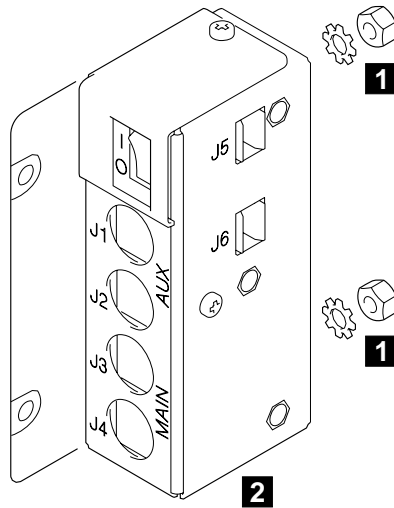
Figure 117. Removing the Remote-Power-On Control Unit from its Bracket

Step 7. Remove the two nuts **1** and their lock washers.

Step 8. Remove the remote-power-on control unit **2** from the bracket.

Step 9. Replace parts in the reverse sequence.

> **Note:** If the 7133 remained operational while you removed the remote-power-on control unit, ensure that the power switch of the remote-power-on control unit that you are going to install is set to **|** (on) *before you reinstall any power-control cables.* Otherwise, when you install the cables, the internal dc power of the 7133 might switch off.

Frame Assembly

Notes:

1. ***Use this procedure only if you are exchanging the frame of the 7133***. If you are removing a complete Model D40 from the rack (for example, to locate it elsewhere), go to "Removing a 7133 Model D40 from a Rack" on page 221.

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

Attention: Unless the using system needs to be switched off for some other reason, do not switch off the using system when servicing the 7133. Power cables and external SSA cables that connect the 7133 to the using system can be disconnected while that system is running.

Step 1. If this 7133 is connected to an operational SSA network, use the SSA service aids, the 7133 service aids, or both, to ensure that all SSA loops that pass through the internal strings of this 7133 are not broken. (For example, all external SSA cables are connected correctly; all disk drive modules and, if required, dummy disk drive modules are installed correctly.) See Displaying Link and Power Problems in the "Additional Information" appendix (in this book) for your using system.

If a loop is broken, repair it before you start to remove the 7133 from the rack; otherwise, the network might fail when you disconnect the 7133.

Step 2. Verify with the customer that all operations between the 7133 and the using system have been stopped.

Step 3. Remove power from the 7133 (see "All Power" on page 145).

Step 4. For Model D40, remove the front cover (see "Covers" on page 138).

For Model T40, open the front cover (see "Covers" on page 138).

Step 5. For Model T40, open the back cover (see "Back Cover (Model T40)" on page 144).

Step 6. Carefully make a note of the locations of the disk drive modules and (if present) dummy disk drive modules that are in the 7133. This action ensures that you reinstall the modules into their original slots. (They might not all be connected to the same SSA loop.) It is recommended that you attach identifying labels to the modules.

Step 7. Remove all the disk drive modules and dummy disk drive modules (see "Removing a Module" on page 150).

Step 8. Remove the three fan assemblies from the front of the 7133 (see "Fan Assemblies" on page 173).

Step 9. Remove the controller card assembly (see "Controller Card Assembly" on page 199).

Step 10. Remove the two power supply assemblies from the back of the 7133 (see "Power Supply Assemblies" on page 162).

Step 11. Make a note of which SSA cables (if present) are connected to each particular bypass card.

Step 12. Disconnect the external SSA cables (if present) from all four bypass cards. To prevent damage to the SSA connector screws, ensure that you use the special screwdriver (SSA tool, part 32H7059) to unscrew them. The screwdriver is supplied with the 7133.

Step 13. **Attention:** The four bypass cards might not all have the same jumper settings. It is important, therefore, that they be reinstalled into the correct positions.

Make a note of the positions of the bypass cards before you remove them. Attach labels if necessary.

Step 14. Remove the four bypass cards (see "Bypass (SNBC) Cards" on page 201).

Step 15. If you are removing the frame assembly of a Model D40 that is in an RS/6000® rack, go to "Model D40 in an RS/6000 Rack" on page 210.

If you are removing the frame assembly of a Model D40 that is in a Netfinity® rack, go to "Model D40 in a Netfinity Rack" on page 215.

If you are removing the frame assembly of a Model T40, go to "Model T40" on page 218.

Model D40 in an RS/6000 Rack

Step 1. **Note:** For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

CAUTION:

- **The stabilizer must be correctly attached to the bottom front of the rack, or the rack must be firmly fastened to the floor, to prevent the rack from tipping forward while the 7133 is being installed into the rack. Do not install or pull out any unit unless either the stabilizer is firmly attached to the rack, or the rack is firmly fastened to the floor, as described in the rack installation instructions.**

- **If the 7133 is installed in a Model T00 or T42 rack, you must also observe the safety notices for those racks before you start to remove the 7133 frame. You can find the safety notices in the System Installation chapter of the** *7014 Model T00 and T42 Rack Installation and Service Guide,* **SA33-0577, or at web page:**

  http://www.rs6000.ibm.com/resource/hardware_docs/sa38-0577/a4aw9bas.html

Refer to Figure 118.
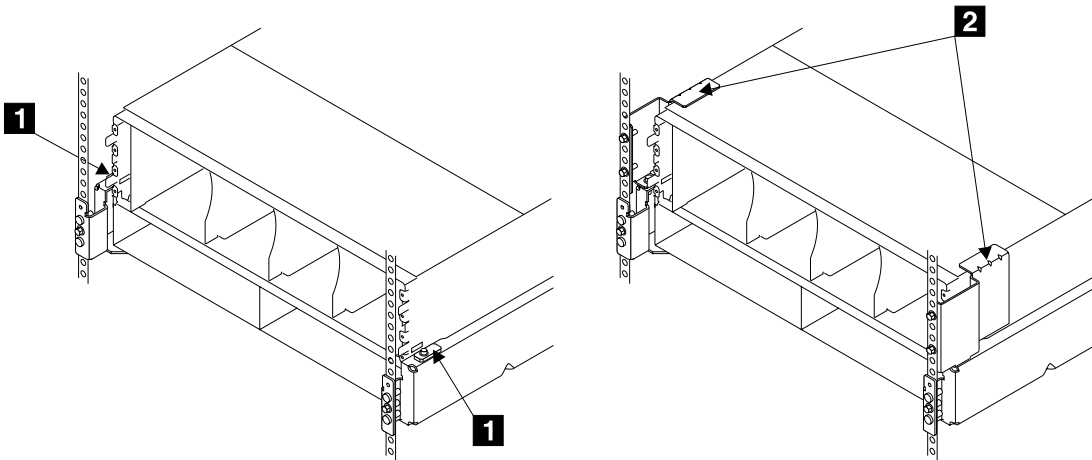
Figure 118. Clamp Plates and Brackets

Step 2. If the back of the 7133 is fastened with clamp plates **1** , go to step 3 on page 211.

If the back of the 7133 is fastened with brackets **2** , go to step 6 on page 212.

Step 3. Refer to Figure 119.
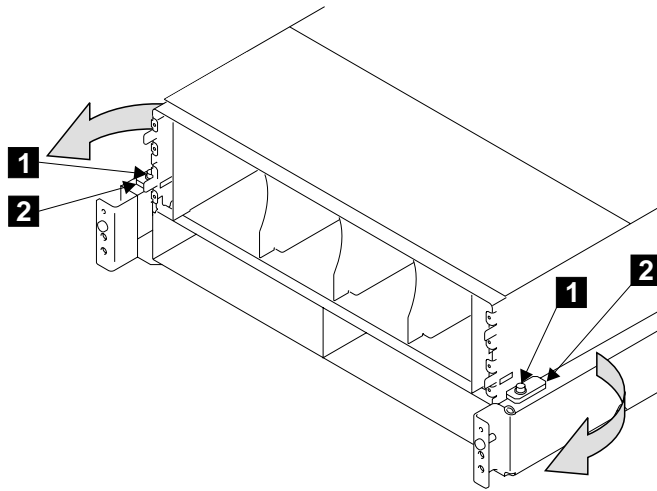
Figure 119. Moving the Clamp Plates

Step 4. Loosen the two screws **1** , and pivot the two clamp plates **2** away from the slots in the frame assembly.

Step 5. Go to step 10 on page 213.

Step 6. Refer to Figure 120.
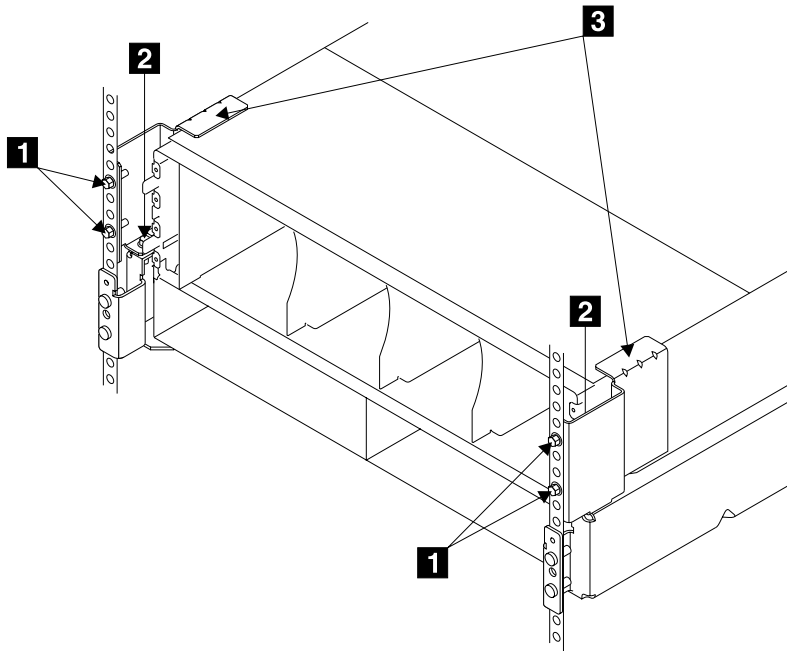
Figure 120. Loosening the Back Brackets (RS/6000)

Step 7. Loosen the screws **1** and **2** .

Step 8. Lift the brackets **3** upward as far as the holes in the rack allow, then tighten the screws **1** *finger tight*. This action removes the pressure of the brackets from the top of the frame assembly.

Step 9. Go to step 10 on page 213.

Step 10. Refer to Figure 121.
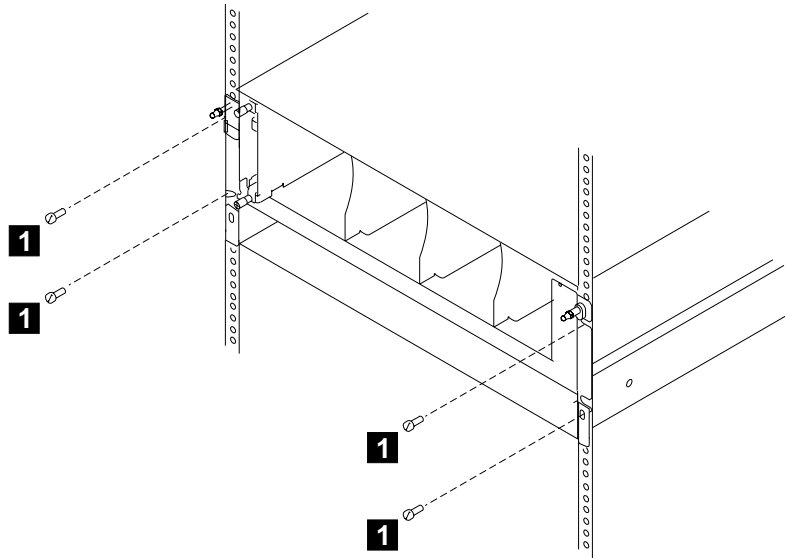
Figure 121. Removing the Frame Assembly from the RS/6000 Rack

Step 11. Remove the four front mounting screws **1** .

Step 12. **Note:** For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

CAUTION:
Do not attempt to lift the 7133 by yourself. Ask another service representative for aid.

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

Step 13. Replace parts in the reverse sequence.

Notes:

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

   1) Install 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.

b. Go to the back of the 7133.

c. Refer to Figure 122.
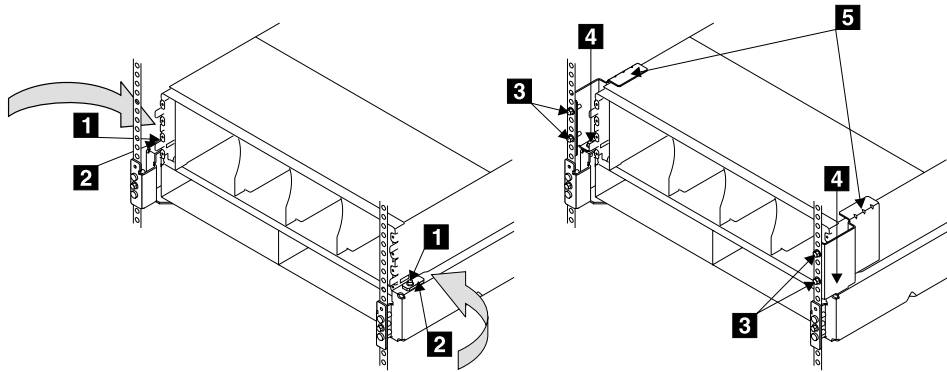
Figure 122. Fastening the Back of the Frame Assembly

d. If you have clamp plates **2** , pivot them inward so that they engage the slots in the sides of the 7133. Tighten their screws **1** .

   If you have brackets **5** , fully tighten the two screws **4** , then fully tighten the four screws **3** .

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

f. If you have installed a replacement frame assembly, attach the blank self-adhesive serial-number label that is supplied with the frame assembly. The new label must cover the original label (see "Labels" on page 36).

g. Write the serial number of the original frame assembly onto the blank label.

h. Destroy the serial number on the original frame assembly.

Model D40 in a Netfinity Rack

Step 1. **Note:** For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

CAUTION:
The stabilizer must be correctly attached to the bottom front of the rack, or the rack must be firmly fastened to the floor, to prevent the rack from tipping forward while the 7133 is being installed into the rack. Do not install or pull out any unit unless either the stabilizer is firmly attached to the rack, or the rack is firmly fastened to the floor, as described in the rack installation instructions.

Refer to Figure 123.
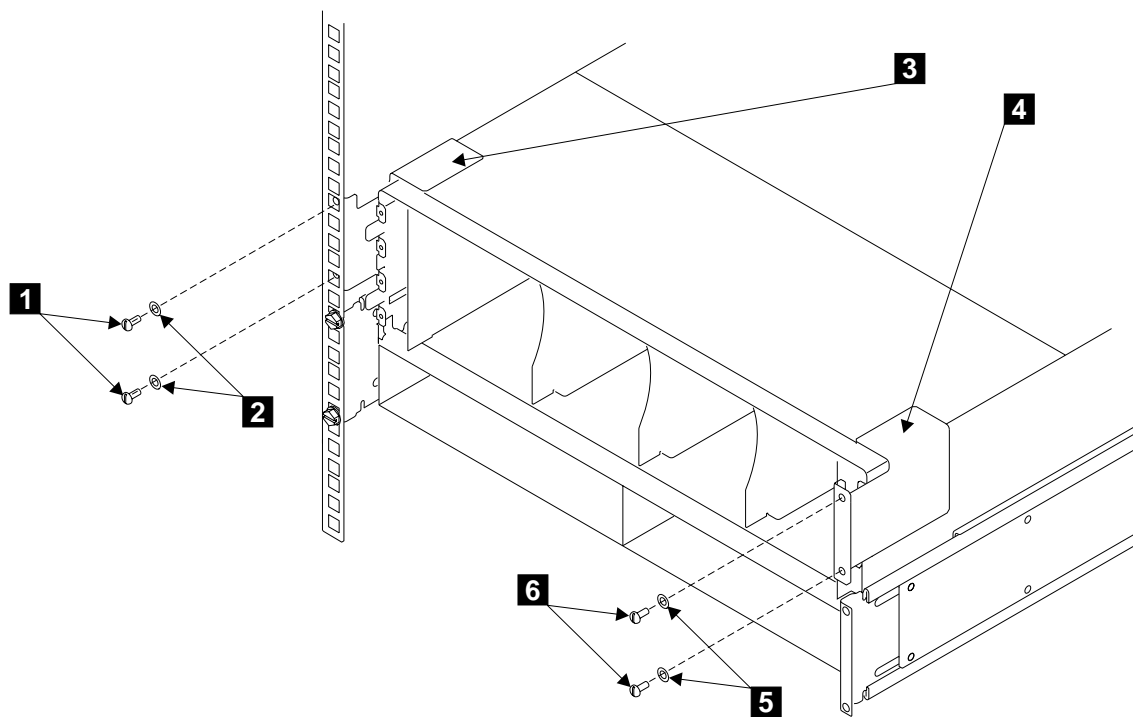
Figure 123. Removing the Back Brackets (Netfinity)

Step 2. At the back of the rack, remove the screws **1** and **6** and the washers **2** and **5** .

Step 3. Remove the two back brackets **3** and **4** .

Step 4. Refer to Figure 124.
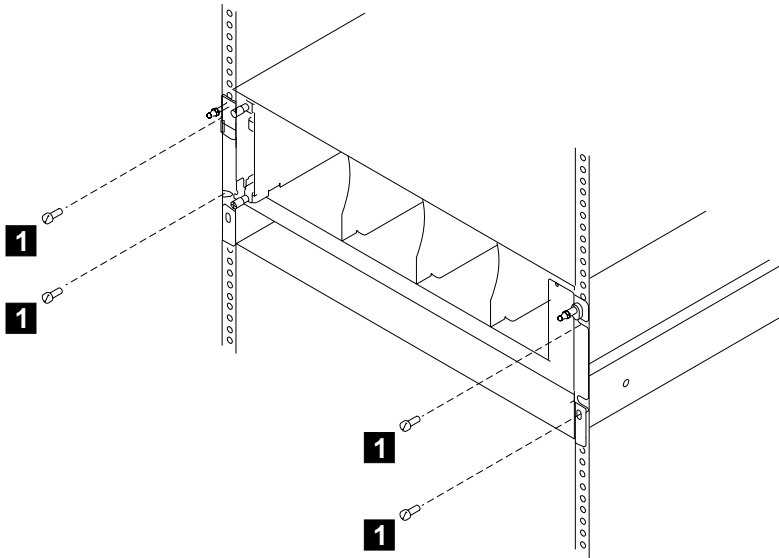
Figure 124. Removing the Front Screws

Step 5. Remove the four front mounting screws **1** .

Step 6. **Note:** For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

CAUTION:
Do not attempt to lift the 7133 by yourself. Ask another service representative for aid.

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

Step 7. Replace parts in the reverse sequence.

Note: When you reinstall the back brackets:

a. Refer to Figure 123 on page 215.

b. Place the back bracket **3** into position.

c. Install the screws **1** and the washers **2** , but do not tighten the screws fully.

d. With a flat hand, press and hold downward the bracket.

e. Fully tighten the top screw. You can now remove your hand from the bracket.

f. Fully tighten the bottom screw.

g. Using the screws **6** and the washers **5** , repeat the procedure for the other back bracket **4** .

h. If you have installed a replacement frame assembly, attach the blank self-adhesive serial-number label that is supplied with the frame assembly. The new label must cover the original label (see "Labels" on page 36).

i. Write the serial number of the original frame assembly onto the blank label.

j. Destroy the serial number on the original frame assembly.

Model T40

Step 1. Remove the front bezel assembly (see "Front Bezel Assembly (Model T40)" on page 183).

Step 2. Remove the power switch and cable assembly (see "Power Switch and Cable Assembly (Model T40)" on page 190).

Step 3. Remove the remote-power-on control unit if present (see "Remote-Power-On Control Unit (Model T40)" on page 206).

Step 4. Refer to Figure 125.
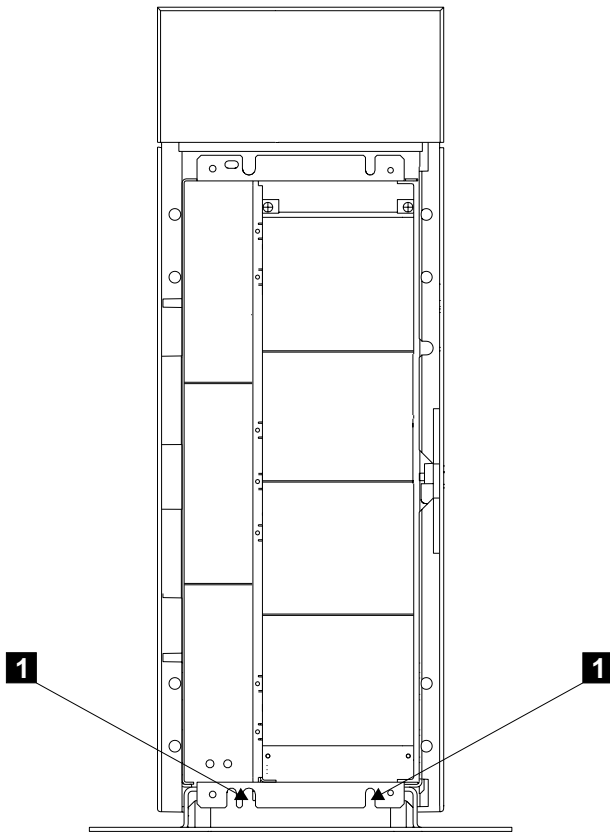
Figure 125. Removing the Frame from a Model T40 (1)

Step 5. Remove the bottom two mounting screws **1** from the front of the frame assembly. (You removed the top two screws and RFI bracket when you removed the front bezel.)

Step 6.   Refer to Figure 126.
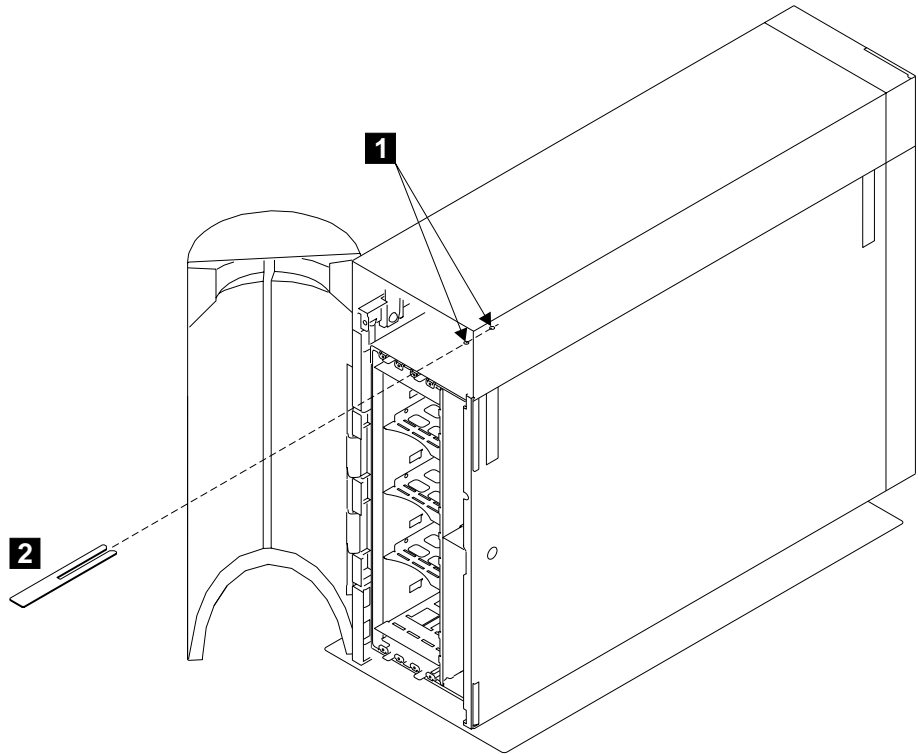
Figure 126. Removing the Frame from a Model T40 (2)

Step 7.   At the back of the 7133, remove the two screws **1** .

Step 8.   Remove the equivalent two screws from the bottom of the frame assembly.

Step 9.   Pull out the shim **2** .

Step 10.   Go to the front of the 7133.

Step 11.   **Note:** For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

CAUTION:
Do not attempt to lift the 7133 by yourself. Ask another service representative for aid.

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

Step 12.   Replace parts in the reverse sequence.

Notes:

a. When you install the frame assembly :

1) Ensure that you reinstall the RFI bracket at the front of the 7133 when you reinstall the front bezel assembly. The RFI bracket prevents radio

frequency interference. Install the RFI bracket **after** you have reconnected the flexible cables (see "Front Bezel Assembly (Model T40)" on page 183).

2) Ensure that you reinstall the shim. This shim ensures that the covers to not become distorted when all the screws are tightened. At the back of the 7133:

   a) Install the two screws (**1** in Figure 126), but do not fully tighten them yet.

   b) Install and fully tighten the equivalent two screws at the bottom of the frame assembly.

   c) Insert the shim between the top support of the deskside unit and the frame of the 7133. Locate the shim so that the top two screws that you have just installed enter the slot of the shim.

   d) Push the shim fully home.

   e) Fully tighten the two screws.

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

c. If you have installed a replacement frame assembly, attach the blank self-adhesive serial-number label that is supplied with the frame assembly. The new label must cover the original label (see "Labels" on page 36).

d. Write the serial number of the original frame assembly onto the blank label.

e. Destroy the serial number on the original frame assembly.

Removing a 7133 Model D40 from a Rack

Notes:

1. *Use this procedure only if you are removing a complete Model D40 from the rack (for example, to locate it elsewhere)*. If you are exchanging the frame of the 7133, go to "Frame Assembly" on page 208.

2. You will need another service representative to help you remove the 7133 from the rack.

Attention: Unless the using system needs to be switched off for some other reason, do not switch off the using system when servicing the 7133. Power cables and external SSA cables that connect the 7133 to the using system can be disconnected while that system is running.

Step 1. If this 7133 is connected to an operational SSA network, use the SSA service aids, the 7133 service aids, or both, to ensure that all SSA loops that pass through the internal strings of this 7133 are not broken. (For example, all external SSA cables are connected correctly; all disk drive modules and, if required, dummy disk drive modules are installed correctly.) An example screen is shown in Displaying Link and Power Problems in the "Additional Information" appendix (in this book) for your using system.

If a loop is broken, repair it before you start to remove the 7133 from the rack; otherwise, the network might fail when you disconnect the 7133.

Step 2. If not already done:

a. Verify with the customer that all operations between the 7133 and the using system have been stopped.

b. If applicable, unconfigure the 7133 from the using system. For more information, see Unconfiguring a 7133 from the Using System in the "Additional Information" appendix (in this book) for your using system.

c. Make a note of the positions of all the external SSA cables that are connected at the back of the 7133.

d. Disconnect all the external SSA cables from the back of the 7133. To prevent damage to the SSA connector screws, ensure that you use the special screwdriver (SSA tool, part 32H7059) to unscrew them. The screwdriver is supplied with the 7133.

e. Remove all power from the 7133 (see "All Power" on page 145).

f. Open the front cover (see "Covers" on page 138).

Step 3. **Note:** For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

CAUTION:
A 7133 Model D40 weighs up to 55 kg (121 lb) with disk drive modules installed. Do not attempt to remove the 7133 from the rack unless all the disk drive modules have been removed.

You are now going to remove all the disk drive modules and (if present) dummy disk drive modules from the 7133. If the 7133 is to be used later with its disk drive modules configured as they are now, carefully make a note of the locations of the disk drive modules and dummy disk drive modules before you start to remove them. This action ensures that you reinstall the modules into their original slots. (They might not all be connected to the same SSA loop.) It is recommended that you attach identifying labels to the modules.

Step 4. Remove the all the disk drive modules (see "Disk Drive Modules and Dummy Disk Drive Modules" on page 150).

Step 5. If you are removing the Model D40 from an RS/6000 rack, go to "Model D40 in an RS/6000 Rack" on page 223.

If you are removing the Model D40 from a Netfinity rack, go to "Model D40 in a Netfinity Rack" on page 229.

Model D40 in an RS/6000 Rack

Step 1. **Note:** For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

CAUTION:

- **The stabilizer must be correctly attached to the bottom front of the rack, or the rack must be firmly fastened to the floor, to prevent the rack from tipping forward while the 7133 is being installed into the rack. Do not install or pull out any unit unless either the stabilizer is firmly attached to the rack, or the rack is firmly fastened to the floor, as described in the rack installation instructions.**

- **If the 7133 is installed in a Model T00 or T42 rack, you must also observe the safety notices for those racks before you start to remove the 7133. You can find the safety notices in the System Installation chapter of the** *7014 Model T00 and T42 Rack Installation and Service Guide,* **SA33-0577, or at web page:**

  http://www.rs6000.ibm.com/resource/hardware_docs/sa38-0577/a4aw9bas.html

Refer to Figure 127.
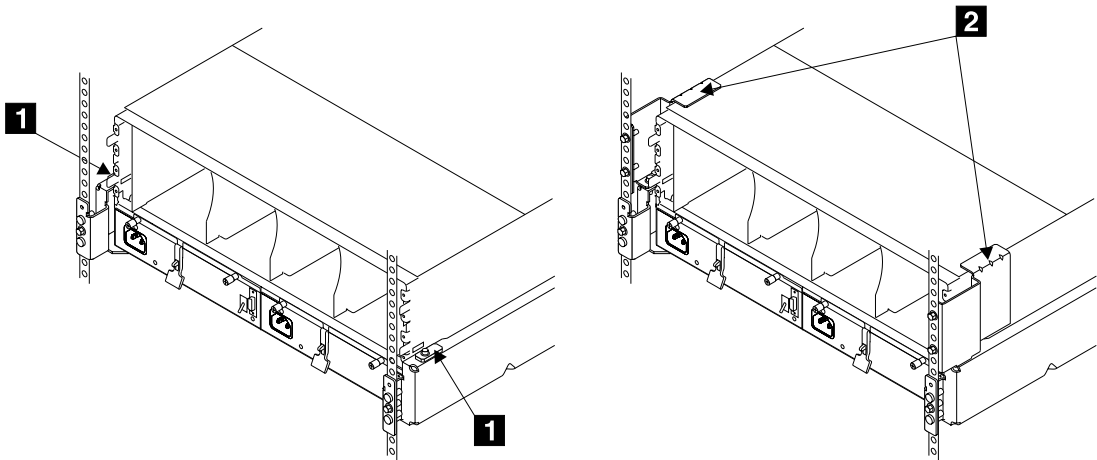
Figure 127. Clamp Plates and Brackets

Step 2. If the back of the 7133 is fastened with clamp plates **1** , go to step 3 on page 224.

If the back of the 7133 is fastened with brackets **2** , go to step 6 on page 225.

Step 3. Refer to Figure 128.
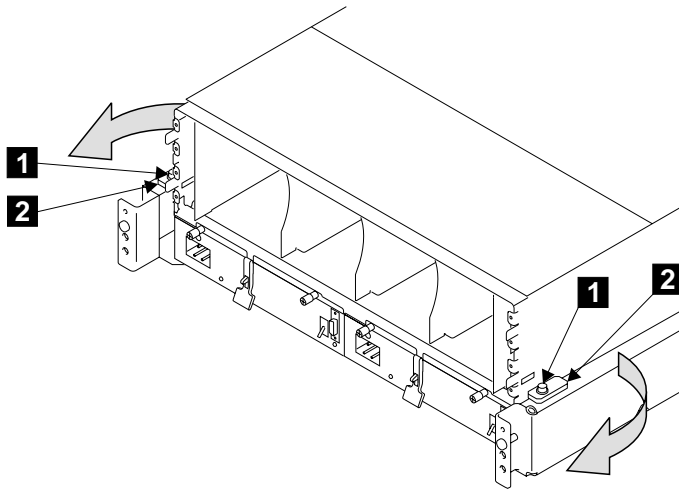
Figure 128. Moving the Clamp Plates

Step 4. Loosen the two screws **1** , and pivot the two clamp plates **2** away from the slots in the 7133.

Step 5. Go to step 10 on page 226.

Step 6.   Refer to Figure 129.
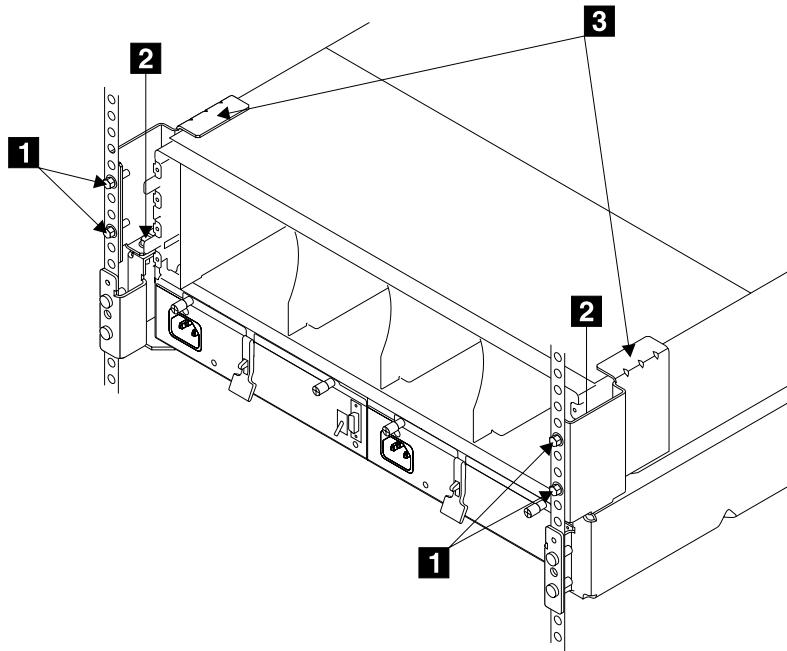
Figure 129. Loosening the Back Brackets (RS/6000)

Step 7.   Loosen the screws **1** and **2** .

Step 8.   Lift the brackets **3** upward as far as the holes in the rack allow, then tighten the screws **1** *finger tight*. This action removes the pressure of the brackets from the top of the frame assembly.

Step 9.   Go to step 10 on page 226.

Step 10. Go to the front of the rack.

Step 11. Refer to Figure 130.
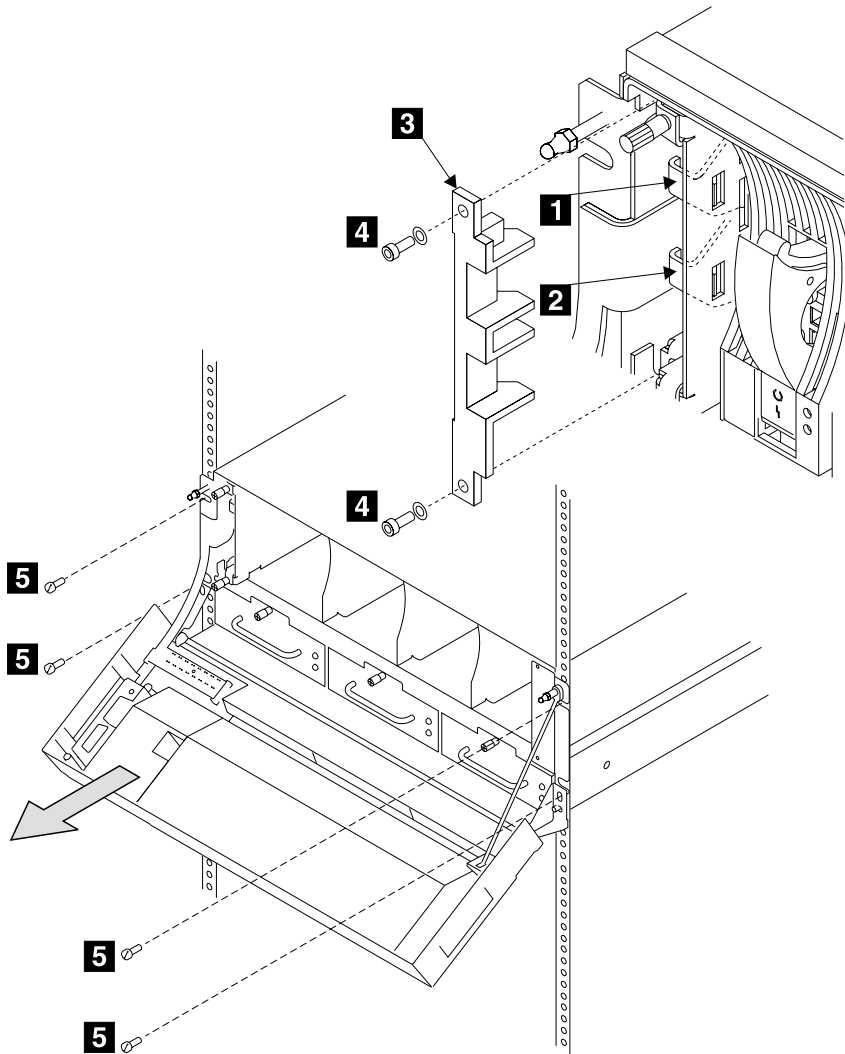
Figure 130. Removing a Model D40 from an RS/6000 Rack

Step 12. **Attention:** To prevent damage to the flexible circuits, disconnect them before you remove the front mounting screws.

If a latch retainer **3** is present, remove the two screws **4** and the latch retainer.

Move the latch **2** to your left, then pull it forward to unplug the operator panel flexible circuit from the controller card assembly.

Step 13. Do the same actions with the latch **1** to unplug the disk drive status lights flexible circuit from the controller card assembly.

Step 14. Remove the front mounting screws **5** .

Step 15. **Note:** For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

CAUTION:
Do not attempt to lift the 7133 by yourself. Ask another service representative for aid.

With aid from another service representative, pull the 7133 forward and remove it from the rack.

Step 16. Reinstall the 7133 in the reverse sequence.

Notes:

a. When you reinstall the 7133 into the rack, reinstall the front mounting screws before you reinstall the back clamp plates or brackets. Reinstall the front mounting screws in the following sequence:

1) Install 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.

b. Go to the back of the 7133.

c. Refer to Figure 131.
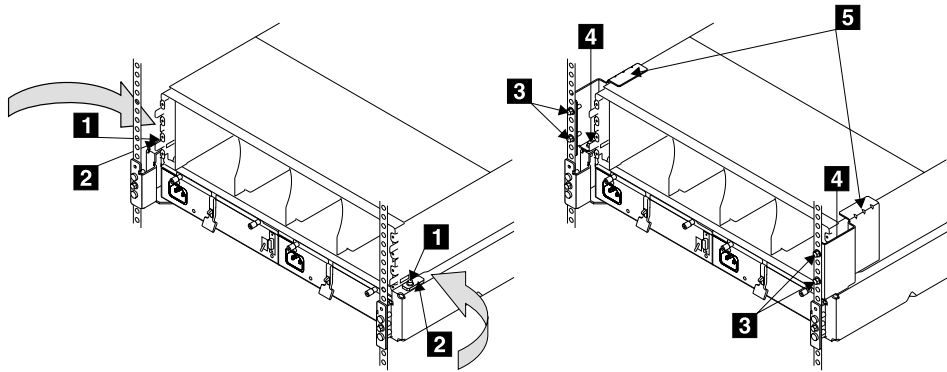
Figure 131. Fastening the Back of the Frame Assembly

d. If you have clamp plates **2** , pivot them inward so that they engage the slots in the sides of the 7133. Tighten their screws **1** .

If you have brackets **5** , fully tighten the two screws **4** , then fully tighten the four screws **3** .

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

Model D40 in a Netfinity Rack

Step 1. **Note:** For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

CAUTION:

The stabilizer must be correctly attached to the bottom front of the rack, or the rack must be firmly fastened to the floor, to prevent the rack from tipping forward while the 7133 is being installed into the rack. Do not install or pull out any unit unless either the stabilizer is firmly attached to the rack, or the rack is firmly fastened to the floor, as described in the rack installation instructions.

Refer to Figure 132.
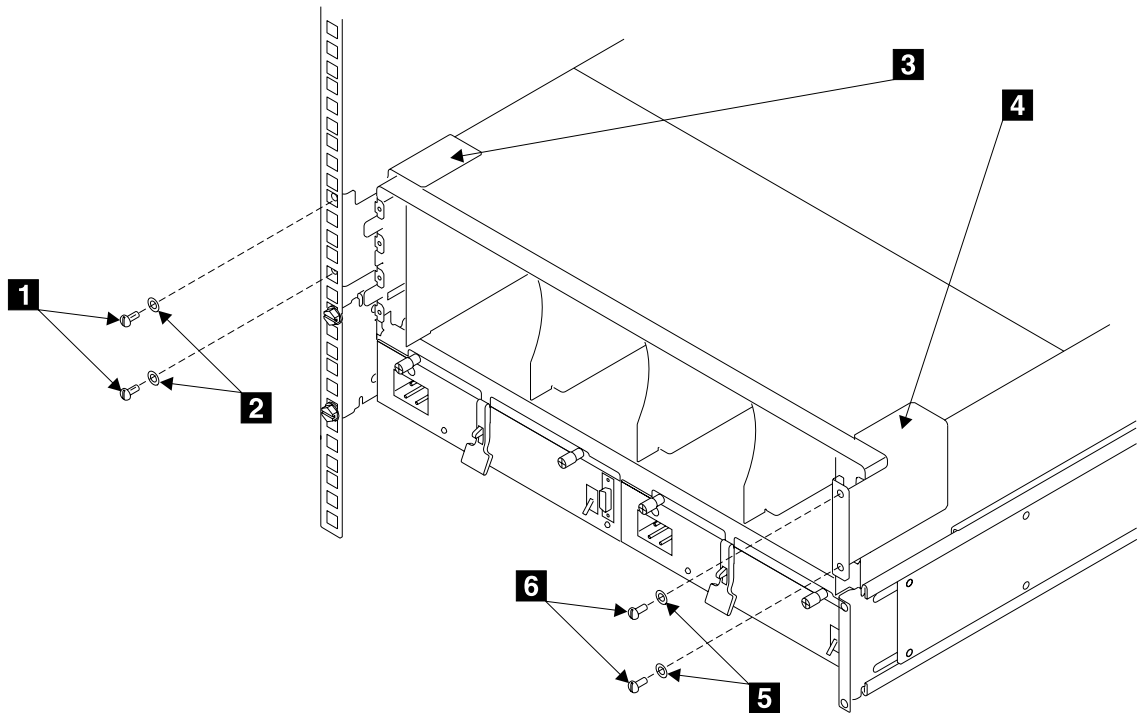
Figure 132. Removing the Back Brackets

Step 2. At the back of the rack, remove the screws **1** and **6** and the washers **2** and **5** .

Step 3. Remove the two back brackets **3** and **4** .

Step 4. Refer to Figure 133.
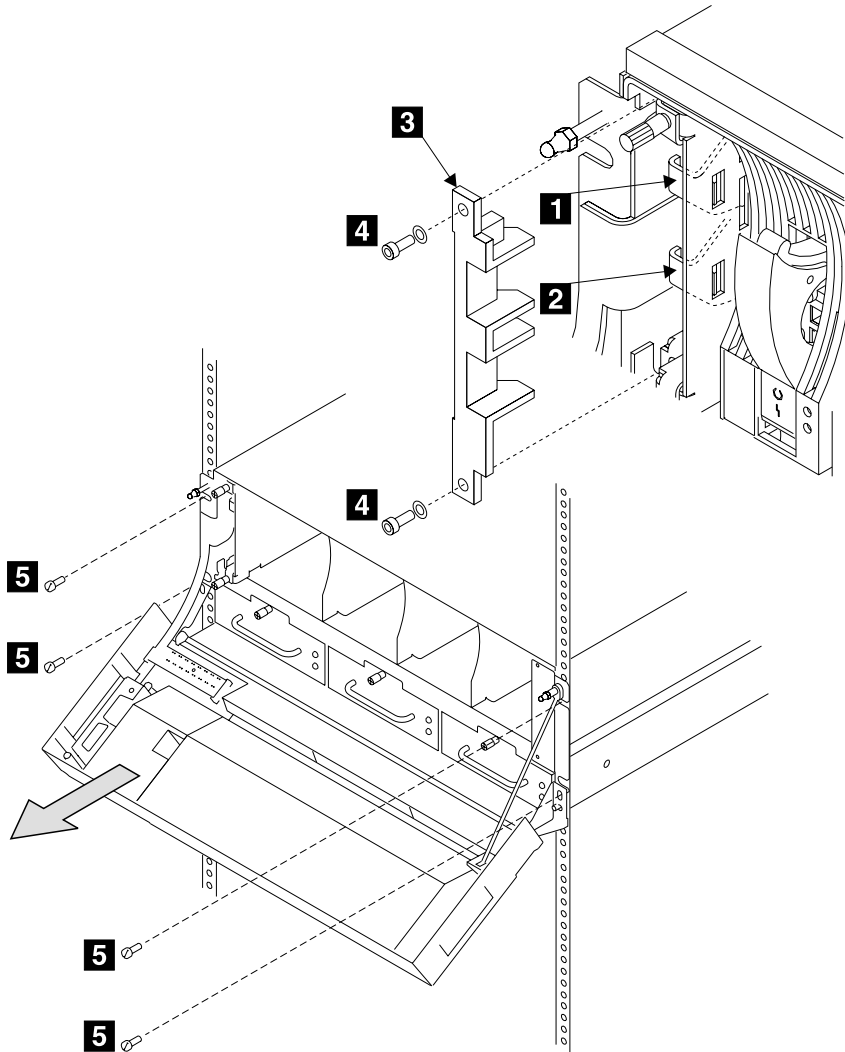
Figure 133. Removing the Front Screws

Step 5. **Attention:** To prevent damage to the flexible circuits, disconnect them before you remove the front mounting screws.

If a latch retainer **3** is present, remove the two screws **4** and the latch retainer.

Move the latch **2** to your left, then pull it forward to unplug the operator panel flexible circuit from the controller card assembly.

Step 6. Do the same actions with the latch **1** to unplug the disk drive status lights flexible circuit from the controller card assembly.

Step 7. Remove the four front mounting screws **5** .

Step 8. **Note:** For a translation of the following notice, see the *7133 Serial Disk Systems and SSA Adapters: Translated Safety Notices* manual.

CAUTION:
Do not attempt to lift the 7133 by yourself. Ask another service representative for aid.

With aid from another service representative, pull the 7133 forward and remove it from the rack.

Step 9. Replace parts in the reverse sequence.

Note: When you reinstall the back brackets:

a. Refer to Figure 132 on page 229.

b. Place the back bracket **3** into position.

c. Install the screws **1** and the washers **2** , but do not tighten the screws fully.

d. With a flat hand, press and hold downward the bracket.

e. Fully tighten the top screw. You can now remove your hand from the bracket.

f. Fully tighten the bottom screw.

g. Using the screws **6** and the washers **5** , repeat the procedure for the other back bracket **4** .

Support Rails

If you are removing the support rails from an RS/6000 rack, go to "RS/6000 Support Rails".

If you are removing the support rails from a Netfinity rack, go to "Netfinity Support Rails" on page 237.

RS/6000 Support Rails

Step 1. If the back of the 7133 is fastened with clamp plates, go directly to step 4 to remove the rails.

If the back of the 7133 is fastened with brackets, go to step 2.

Step 2. Refer to Figure 134.
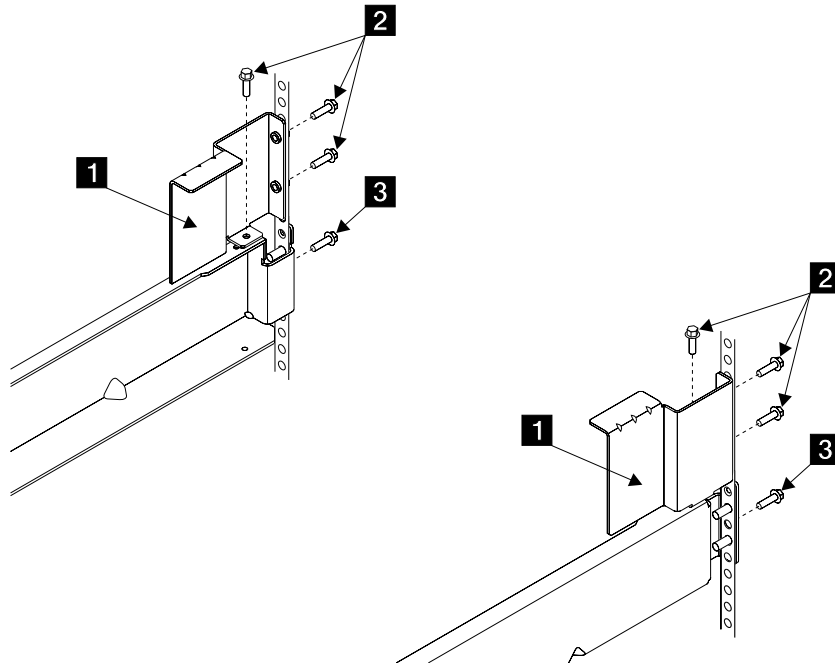
Figure 134. Removing the Support Rails from an RS/6000 Rack

Step 3. Remove the screws **2** and the brackets **1**, then go to step 4.

Step 4. Remove the screws **3**, then remove the rails.

Step 5. If you need to reinstall the support rails (for example, because you are relocating the 7133), or you need to install replacement rails, go to step 6 on page 233.

Step 6. The 7133 Model D40 is four EIA[1] units high. Using the preinstallation planning information, or other information supplied by the customer, determine where you are going to locate the 7133 in the rack.

Step 7. 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 subsystems.

---

1. Electronics Industries Association.

Step 8. For each support rail:

    a. Refer to Figure 135.
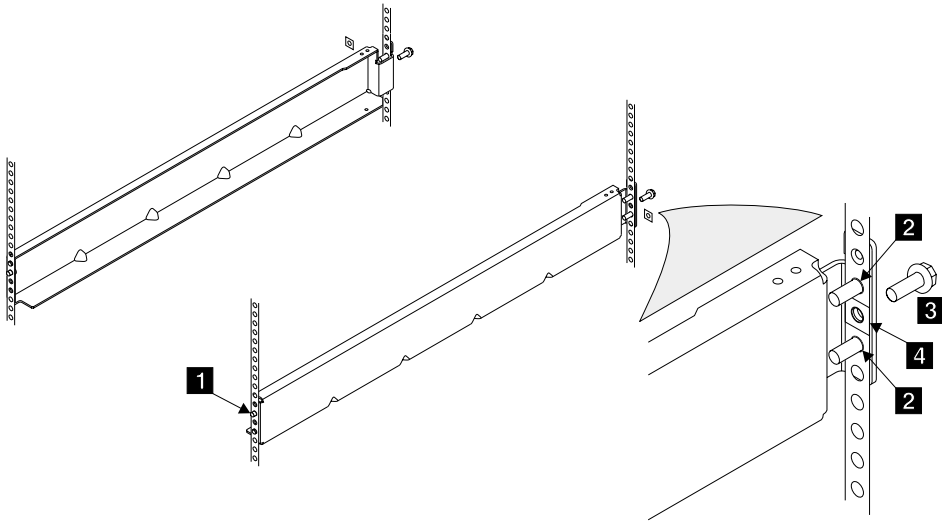
Figure 135. Installing the Support Rails into an RS/6000 Rack

    b. Attach a nut clip **4** at the selected hole in the back of the rack.

    c. Insert the two studs **2** of the support rail into the back of the rack. Hold the support rail so that it is horizontal, and push it forward so that the stud **1** enters the matching hole in the front of the rack.

    d. Check whether the support rail is horizontal (a spirit level might be useful here). If the rail is not horizontal, remove it from the rack, then repeat step 8c.

    e. Insert the rail screw **3** into the nut clip **4**, and tighten it.

Step   9.   Refer to Figure 136.
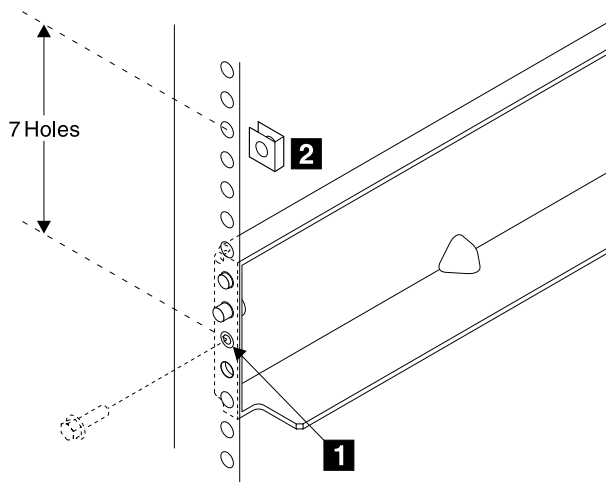
Figure 136. Installing the Nut Clips

Step 10.   At the front of the rack, observe the threaded hole **1** in each of the support
rails that you have just installed.

Step 11.   Count seven holes upward from each threaded hole, and install a nut
clip   **2** .

Step 12.   If the support rails have clamp plates, go no further with these instructions. If
the rails require brackets, go to step 13 on page 236.

Step 13. Refer to Figure 137.
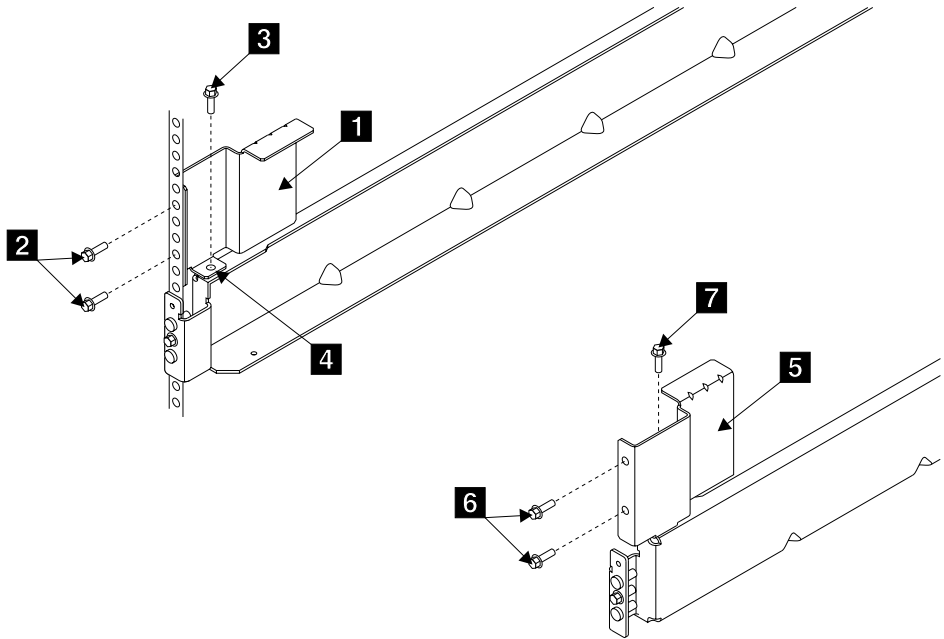
Figure 137. Installing the Back Brackets onto an RS/6000 Rack

Step 14. Place the right-hand back bracket **1** (now on your left) into position, so that
its small flange **4** touches the support rail.

Step 15. Install the screws **2** , but tighten them only a few turns.

Step 16. Lift the bracket upward as far as the holes in the rack allow, then tighten both
screws **finger tight**.

Step 17. Install the screw **3** , and tighten it **finger tight**.

Step 18. Place the other back bracket **5** into position, as shown in Figure 137.

Step 19. Using the screws **6** and **7** , repeat steps 15 through 17.

Netfinity Support Rails

Step 1. Refer to Figure 138.
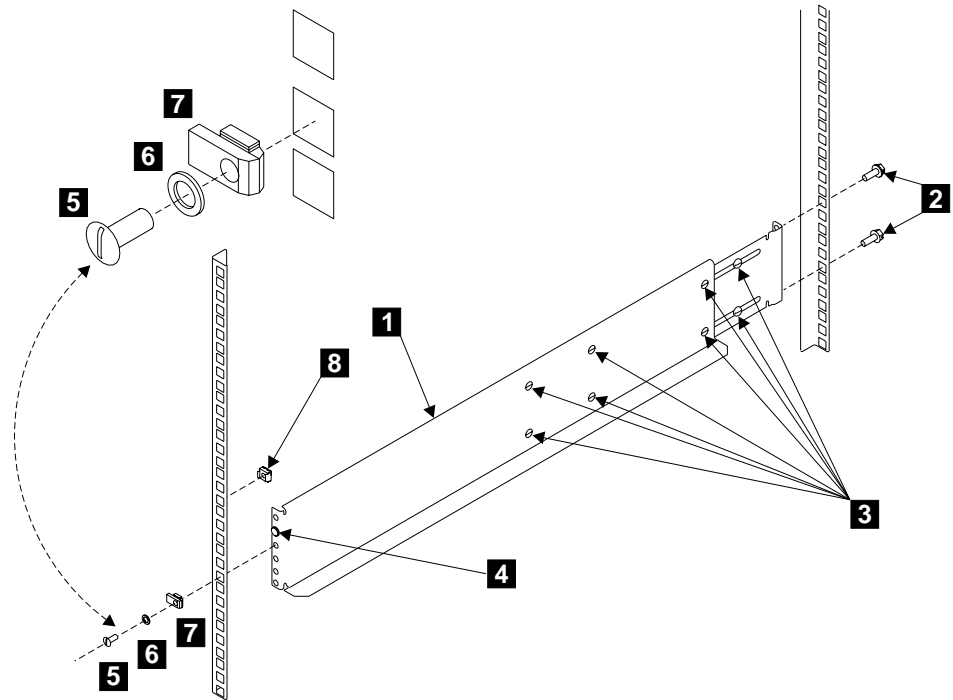
Figure 138. Removing Support Rails from a Netfinity Rack

Step 2. Go to the left-hand support rail **1** .

Step 3. Loosen the eight adjustment screws **3** .

Step 4. Remove the pan head M4 screw **5** and the lock washer **6** .

Step 5. Remove the rail retainer **7** .

Step 6. Disengage the locator pin **4** from the rack, and slide the front part of the rail toward the back of the rack to shorten the rail.

Step 7. Hold the support rail in position, and remove the two hexagonal mounting screws **2** from the back of the rail.

Step 8. Remove the support rail from the rack.

Step 9. Repeat steps 3 through 8 for the right-hand support rail.

Step 10. Remove the nut clips **8** from the rack if they are no longer needed. Put them into a safe place for possible later use.

Step 11. If you need to reinstall the support rails (for example, because you are relocating the 7133), or you need to install replacement support rails, go to step 12.

Step 12. Refer to Figure 139.
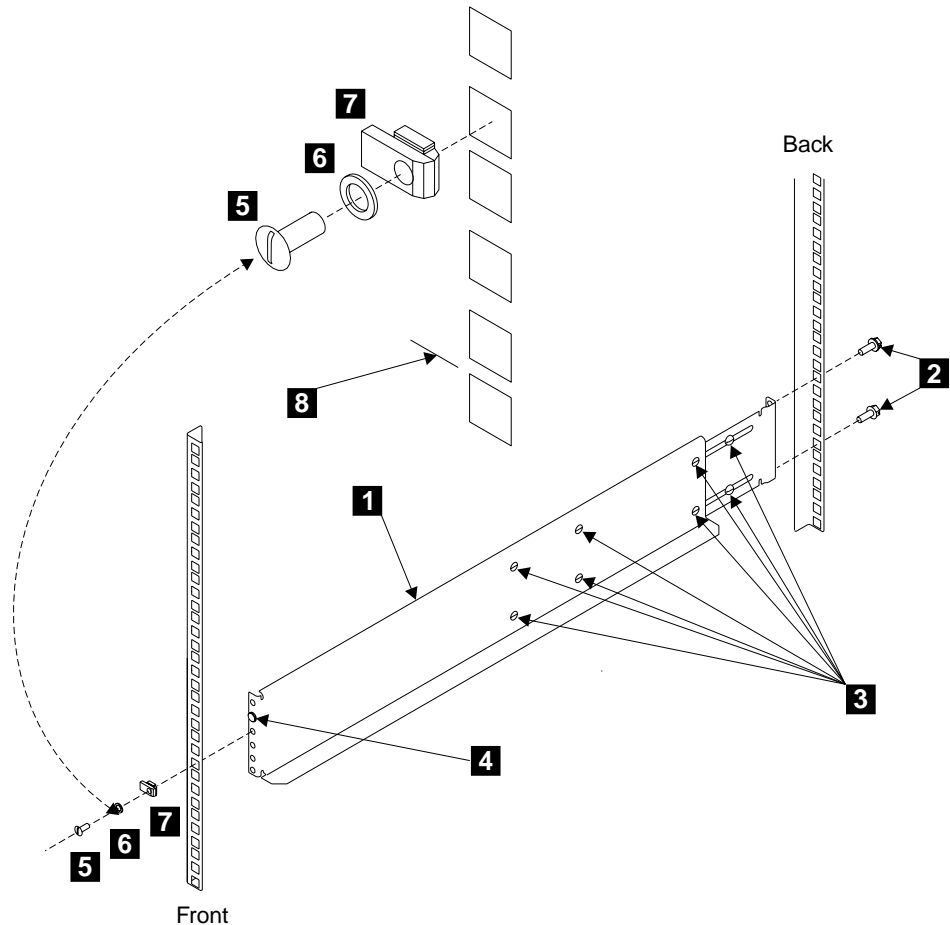
Figure 139. Installing Support Rails into a Netfinity Rack

Step 13. Observe the EIA positions on the rack, and determine where you are going to install the 7133. If appropriate, allow for possible future installation of other subsystems.

> **Note:** The bottom flange of the support rail must align with the EIA mark **8** (on a narrow bar of the rack).

Step 14. Find the left-hand support rail **1** .

Step 15. Loosen the eight adjustment screws **3** .

Step 16. Hold the support rail in position in the rack, then install and fully tighten the two hexagonal M6 mounting screws **2** at the back of the rail.

Step 17. Extend the support rail toward the front of the rack.

Note: Hold the support rail in position until you have completed step 21.

Step 18. Ensure that the support rail is horizontal (a spirit level might be useful here).

Step 19. Install the rail retainer **7** .

Step 20. Install the pan head M4 screw **5** and lock washer **6** .

Step 21. Fully tighten the screw.

Step 22. Ensure that the rail retainer has fully engaged the hole in the rack.

If the retainer has not engaged the hole, loosen the screw, reengage the retainer, then tighten the screw fully.

Step 23. Ensure that the locator pin **4** is flush with the front edge of the rack.

If the locator pin is not flush, loosen the screw, reengage the retainer, then tighten the screw fully.

Step 24. Fully tighten the eight adjustment screws **3** .

Step 25. Repeat steps 15 through 24 for the right-hand support rail.

Step 26.   Refer to Figure 140.
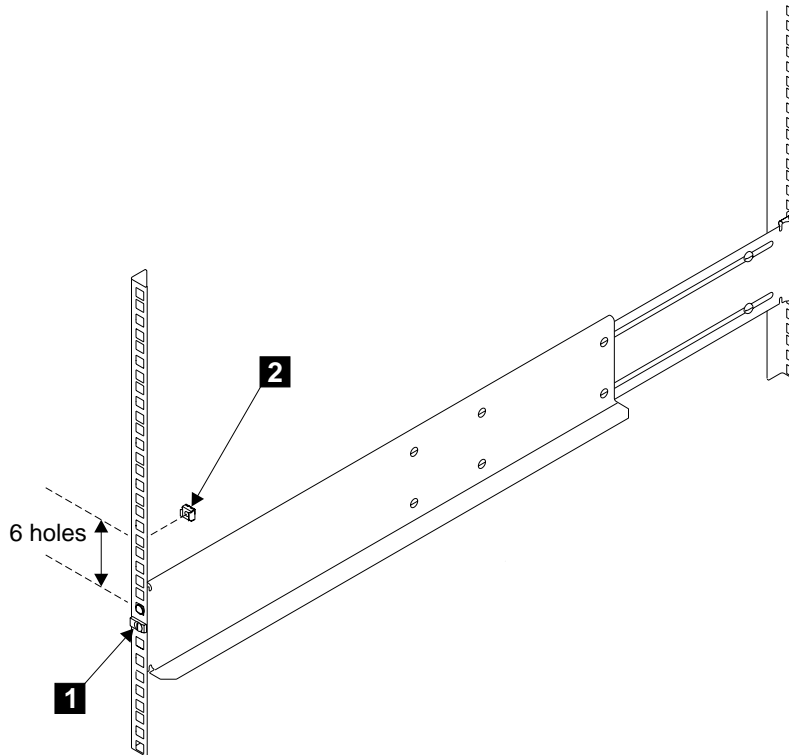
Figure 140. Installing the Nut Clips

Step 27.   At the front of the rack, on the left-hand side, count six holes up *from* the retainer screw **1** .

Step 28.   At the sixth hole, install a nut clip **2** .

Step 29.   Repeat for the right-hand side of the rack.

Chapter 4. Parts Catalog

Are You Using the Correct Book? *Do not use this book if you are servicing a 7133 Model 010, 020, 500, or 600 SSA Disk Subsystem.* For the correct book, see Related Publications in the "Additional Information" appendix (in this book) for your using system.

This parts catalog gives part numbers for the parts and FRUs of the 7133 Models D40 and T40.

Conventions

AR   in the units column of the parts list denotes that the quantity used is as required.

Assembly 1: 7133 Model D40
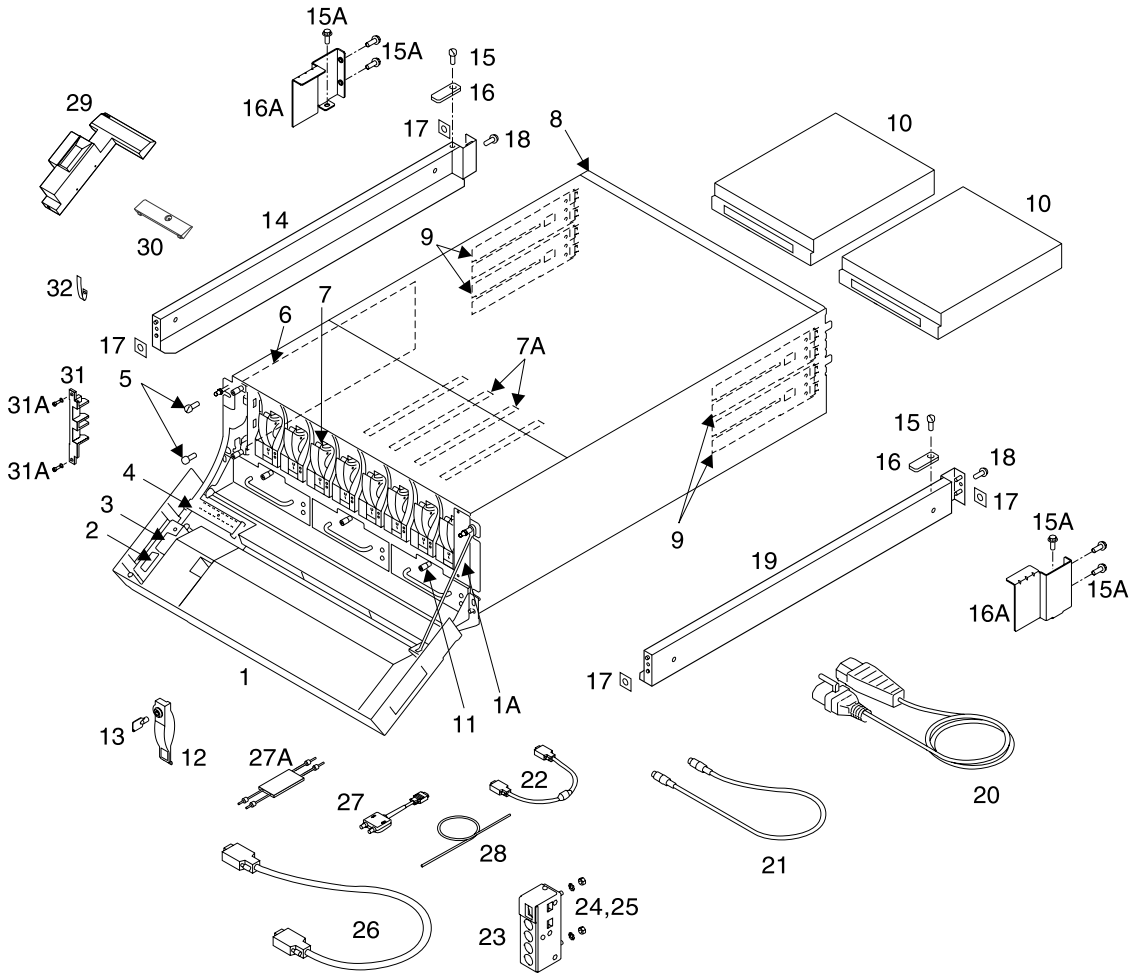
Asm–Index	Part Number	Units	Description
1–1	09L1686	1	Front cover assembly without operator panel and cables (white)
–1	09L1687	1	Front cover assembly without operator panel and cables (black)
–1A	08L7946	1	Strap
–1B	08L7785	2	Ball stud
–2	08L7924	1	Operator panel assembly
–3	09L1677		Operator panel cable assembly
–4	09L1676	1	Disk drive status lights assembly
–5	77G0599	4	Front mounting screw
–6	27H0641	1	Controller card assembly
–6	27H0708	1	Optional alternative controller card assembly (functionally the same as 27H0641)
–7	09L1848	AR	4.5 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 4500 MB)
–7	09L1847	AR	9.1 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 9100 MB)
–7	18P4046	AR	9.1 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 9100 MB)
–7	18P4050	AR	Optional alternative 9.1 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 9100 MB)
–7	18P2196	AR	Optional alternative 9.1 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 9100 MB)
–7	34L8484	AR	Optional alternative 9.1 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 9100 MB)
–7	09L1849	AR	18.2 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 18200 MB)
–7	18P4047	AR	18.2 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
–7	18P4051	AR	Optional alternative 18.2 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
–7	18P2197	AR	Optional alternative 18.2 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
–7	34L8486	AR	Optional alternative 18.2 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
–7	18P5161	AR	18.2 GB, 3.5-inch, 15 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
–7	34L7771	AR	36.4 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 36400 MB)
–7	18P4048	AR	36.4 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 36400 MB)
–7	18P4052	AR	Optional alternative 36.4 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 36400 MB)

Assembly 1: (continued)
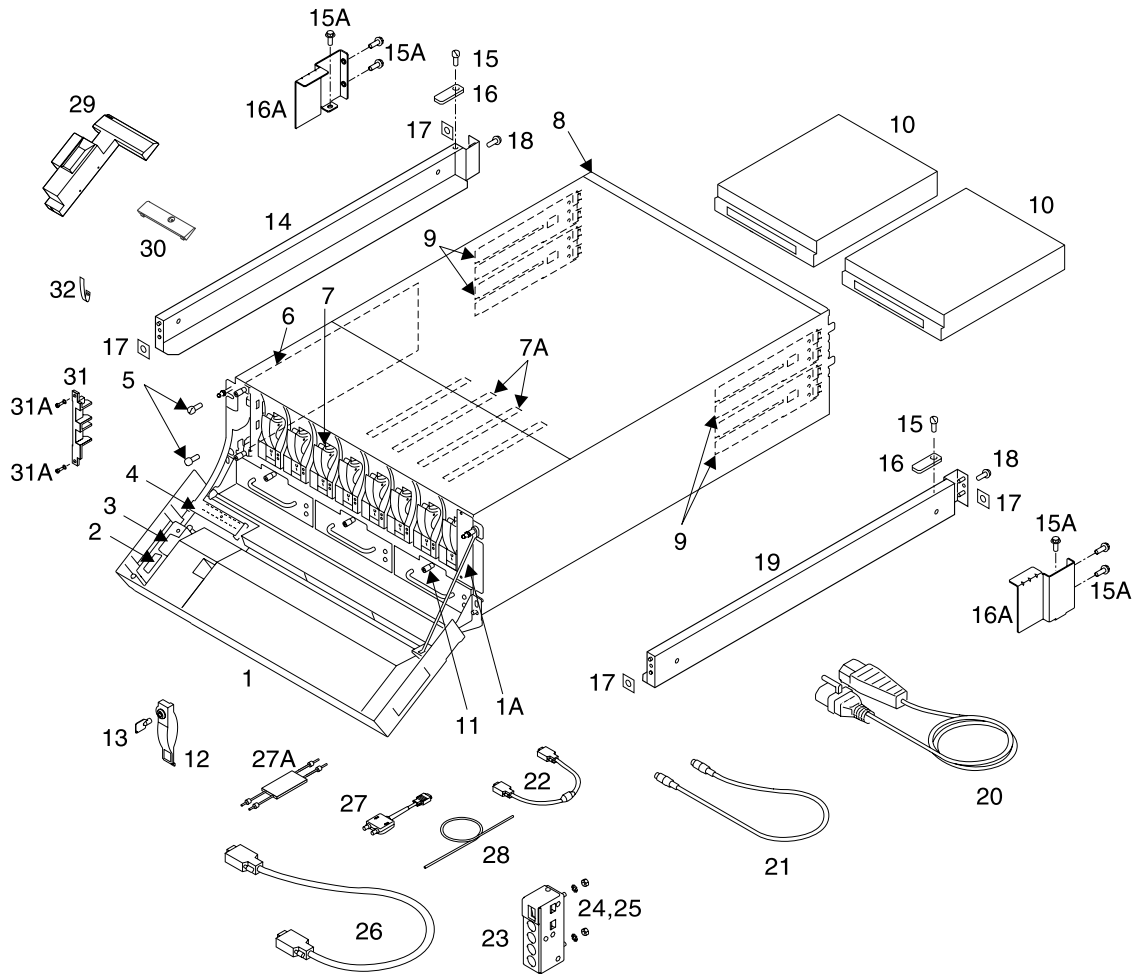
Asm–Index	Part Number	Units	Description
1–7	18P2200	AR	Optional alternative 36.4 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 36400 MB)
–7	18P5163	AR	36.4 GB, 3.5-inch, 15 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 36400 MB)
–7	18P4049	AR	72.8 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 72800 MB)
–7	18P4053	AR	Optional alternative 72.8 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 72800 MB)
–7	18P6114	AR	145.6 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 145600 MB)
–7	05J8006	AR	Dummy disk drive module
–7A	05J7885	16	Plastic guide rail for disk drive modules
–8	09L1850	1	Frame assembly (FRU kit, including foam baffle and labels)
–9	09L5580	4	Bypass (SNBC) card
–10	09L4299	2	Power supply assembly, 220 V ac/dc
–10	05J8390	2	Power supply assembly, –48 V dc
–11	09L2794	3	Fan assembly
–12	09L1846	AR	Lock assembly for disk drive module
–13	-	-	Key (included in lock assembly 09L1846)
–14	51H8803	1	Support rail, left, for RS/6000 rack (for use with back clamp plate 51H8804)
–14	09L4370	1	Support rail, left, for RS/6000 rack (for use with back bracket 09L4372)
–14	09L1821	1	Support rail kit for Netfinity rack (includes right- and left-hand rails and back brackets, and all required screws and nuts)
–15	77G0599	2	Back mounting screw, Socket Head, M5 x 14 mm long (for back clamp plates)
–15A	54G2882	6	Back mounting screw, Hex Head, M5 x 10 mm long (for back brackets)
–16	51H8804	2	Back clamp plate for RS/6000 rack (early-type back fastening)
–16A	09L4372	1	Back bracket, left, for RS/6000 rack (later-type back fastening)
–16B	09L4373	1	Back bracket, right, for RS/6000 rack (later-type back fastening). Do not use if remote-power-on control unit is required.
–16B	34L6469	1	Back bracket, right, for RS/6000 rack (later-type back fastening). Use if remote-power-on control unit is required.
–17	74F1823	4	Nut clip
–18	77G0599	2	Screw, Hex/Washer Head, M5 x 14 mm long
–19	51H8802	1	Support rail, right, for RS/6000 rack (for use with back clamp plate 51H8804)
–19	09L4371	1	Support rail, right, for RS/6000 rack (for use with back bracket 09L4373)
–19	09L1821	1	Support rail kit for Netfinity rack (includes right- and left-hand rails and back brackets, and all required screws and nuts)
–20	09L1682	2	Power cable
–21	42F6839	4	Using-system power-control cable
–22	08L7873	1	7133 power-control cable
–23	67G5181	1	Remote-power-on control unit
–24	1622347	2	Lock washer, M5
–25	1622404	2	Nut, M5

Assembly 1: (continued)
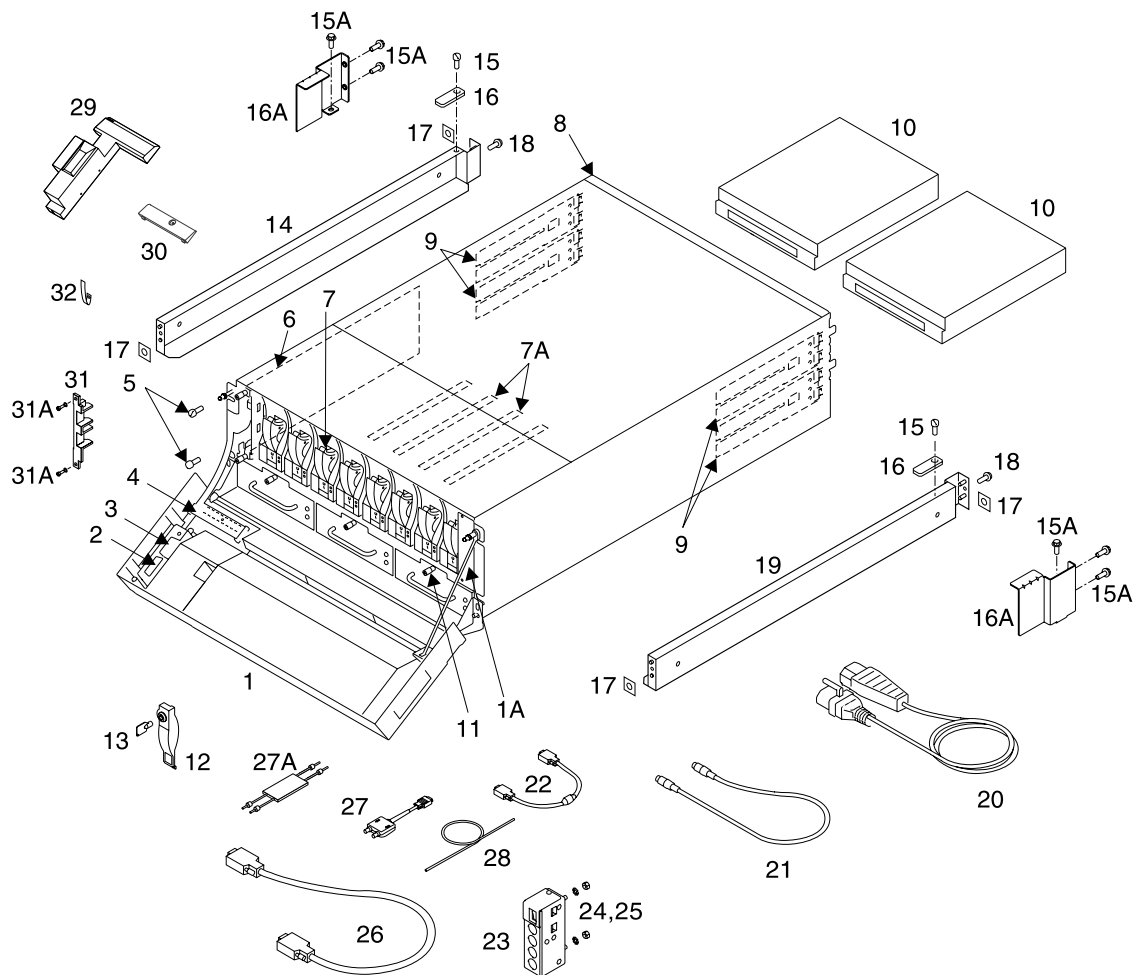
Asm–Index	Part Number	Units	Description
1–26	08L7908	AR	External SSA copper cable, 1.0 m (3.3 ft)
–26	08L7909	AR	External SSA copper cable, 2.5 m (8.2 ft)
–26	08L7910	AR	External SSA copper cable, 5.0 m (16.4 ft)
–26	08L7911	AR	External SSA copper cable, 10.0 m (32.8 ft)
–26	08L7912	AR	External SSA copper cable, 25.0 m (82.0 ft)
–27	09L2120	AR	Advanced SSA Optical Extender
–27A	09L5564	AR	Advanced Multi-Mode 50 Conditioner (for 50-micron fibre optic cables)
–27A	09L5565	AR	Advanced Multi-Mode 62 Conditioner (for 62.5-micron fibre optic cables)
–28	32H7046	AR	Wrap cable and adapter assembly for optical extender
–29	09L1693	1	Cover, ESD
–30	08L7906	1	Cover, LED cable
–31	34L6453	1	Latch retainer
–31A	05J7994	2	Screw
–32	08L7905	1	Plastic cable shield

Assembly 2: 7133 Model T40

Asm– Index	Part Number	Units	Description
2–1	18P3599	1	Complete set of covers, which consists of:
			•Front cover
			•Back cover
			•Top cover
			•Left-hand side cover
			•Right-hand side cover
			•Foot
			Note: The top cover is available also as a separate item (see 1B)
–1A	09L4377	1	Front bezel
–1B	05J7959	1	Top cover
–2	05J7974	1	Disk drive status lights cable assembly
–3	08L7773	1	Operator panel assembly
–4	08L7774	1	Operator panel cable assembly
–5	27H0641	1	Controller card assembly
–5	27H0708	1	Optional alternative controller card assembly (functionally the same as 27H0641)
–6	09L1702	1	Early-type power switch and cable assembly
–6	09L1678	1	Later-type power switch and cable assembly
–7	09L1850	1	Frame assembly (FRU kit, including foam baffle and labels)
–8	09L5580	4	Bypass (SNBC) card
–9	67G5181	1	Remote-power-on control unit
–10	1622404	2	Nut, M5
–11	1622347	2	Lock washer, M5
–12	09L4299	2	Power supply assembly, 220 V ac/dc
–13	VARIOUS	2	Power cable. See "Country Power Cables" on page 252.
–14	42F6839	4	Using-system power-control cable
–15	05J7999	1	7133 power-control cable
–16	08L7908	AR	External SSA copper cable, 1.0 m (3.3 ft)
–16	08L7909	AR	External SSA copper cable, 2.5 m (8.2 ft)
–16	08L7910	AR	External SSA copper cable, 5.0 m (16.4 ft)
–16	08L7911	AR	External SSA copper cable, 10.0 m (32.8 ft)
–16	08L7912	AR	External SSA copper cable, 25.0 m (82.0 ft)
–17	09L2120	AR	External SSA copper cable, 25.0 m (82.0 ft)
–17A	09L5564	AR	Advanced Multi-Mode 50 Conditioner (for 50-micron fibre optic cables)
–17A	09L5565	AR	Advanced Multi-Mode 62 Conditioner (for 62.5-micron fibre optic cables)
–18	32H7046	AR	Wrap cable and adapter assembly for optical extender
–19	09L1848	AR	4.5 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 4500 MB)
–19	09L1847	AR	9.1 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 9100 MB)

Assembly 2: (continued)

Asm–Index	Part Number	Units	Description
2–19	18P4046	AR	9.1 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 9100 MB)
–19	18P4050	AR	Optional alternative 9.1 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 9100 MB)
–19	18P2196	AR	Optional alternative 9.1 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 9100 MB)
–19	34L8484	AR	Optional alternative 9.1 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 9100 MB)
–19	09L1849	AR	18.2 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 18200 MB)
–19	18P4047	AR	18.2 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
–19	18P4051	AR	Optional alternative 18.2 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
–19	18P2197	AR	Optional alternative 18.2 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
–19	34L8486	AR	Optional alternative 18.2 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
–19	18P5161	AR	18.2 GB, 3.5-inch, 15 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
–19	34L7771	AR	36.4 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 36400 MB)
–19	18P4048	AR	36.4 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 36400 MB)
–19	18P4052	AR	Optional alternative 36.4 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 36400 MB)
–19	18P2200	AR	Optional alternative 36.4 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 36400 MB)
–19	18P5163	AR	36.4 GB, 3.5-inch, 15 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 36400 MB)
–19	18P4049	AR	72.8 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 72800 MB)
–19	18P4053	AR	Optional alternative 72.8 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 72800 MB)
–19	18P6114	AR	145.6 GB, 3.5-inch, 10 000 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive 145600 MB)
–19	05J8006	AR	Dummy disk drive module
–19A	05J7885	16	Plastic guide rail for disk drive modules
–20	84X4760	8	Mounting screw
–21	-	-	Key (included in lock assembly 09L1846)
–22	09L1846	AR	Lock assembly for disk drive module
–23	09L2794	3	Fan assembly
–24	09L2290	1	Bracket, RFI
–25	09L1760	1	Shim

Country Power Cables

Country	Rating	Length	Part
United States and Canada	125 V 15 A 125 V 15 A 250 V 15 A	1.8 m (6 ft) 4.3.m (14 ft) 2.7 m (9 ft)	76H4865 12J5112 12J5120
Argentina	250 V 18 A	2.7 m (9 ft)	12J5118
Australia	250 V 15 A	2.7 m (9 ft)	12J5128
China	125 V 15 A	2.7 m (9 ft)	12J5118
Denmark and Switzerland	250 V 16 A	2.7 m (9 ft)	36L8822
France	250 V 16 A	2.7 m (9 ft)	55H6643
Israel	250 V 16 A	2.7 m (9 ft)	12J5122
Italy	250 V 16 A	2.7 m (9 ft)	12J5126
Japan	125 V 15 A	2.7 m (9 ft)	01K9853
Mexico	250 V 15 A	2.7 m (9 ft)	12J5119
New Zealand	250 V 15 A	4.3 m (14 ft)	14F1558
South Africa	250 V 16 A	2.7 m (9 ft)	12J5124
United Kingdom	250 V 13 A	2.7 m (9 ft)	12J5987

Appendix A. Additional Information for RISC Systems

This appendix provides information that is specific to 7133 Models D40 and T40 that
are attached to RISC systems.

Related Publications

- *7014 Model S00 Rack: Installation and Service Guide,* SA38-0550
- *7015 Model R00 Rack: Installation and Service Guide,* SA23-2744
- *7014 Model T00 and T42 Rack Installation and Service Guide,* SA38-0577
- *Diagnostic Information for Micro Channel Bus Systems,* SA23-2765
- *Diagnostic Information for Multiple Bus Systems,* SA38-0509
- *Site and Hardware Planning Information,* SA38-0508
- *Adapters, Devices, and Cable Information for Micro Channel Bus Systems,* SA23-2764
- *Adapters, Devices, and Cable Information for Multiple Bus Systems,* SA38-0516
- *SSA Adapters: User's Guide and Maintenance Information,* SA33-3272
- *Advanced SerialRAID Adapters: User's Guide and Maintenance Information,* SA33-3285

Are You Using the Correct Book? *Do not use this book if you are servicing a 7133 Model 010, 020, 500, or 600 SSA Disk Subsystem.* For those models, use the *7133 SSA Disk Subsystem: Service Guide,* SY33-0185.

Web Support Pages

When you are installing an SSA device or subsystem, upgrading your SSA subsystem, or doing preventive maintenance on your SSA subsystem, refer to the web pages that are listed here. Refer to these pages also if you are upgrading your system hardware or operating system, and the system contains SSA devices. These web pages provide access to the latest SSA publications and support-microcode for the using system, SSA adapters, and SSA subsystem.

http://www.hursley.ibm.com/ssa/

> This web page provides links to SSA publications and other web pages, including the other web page in this list.

http://www.hursley.ibm.com/ssa/rs6k/

> This web page contains a list of the latest levels of SSA support microcode, and provides a microcode download capability for the RS/6000 and AIX environments.

Addressing SSA Disk Drives

This section describes how SSA devices and adapters are known to the using system programs. The AIX system uses this information to configure the 7133 to the system.

Location Code Format

Location codes identify the locations of adapters and devices in the using system and its attached subsystems and devices. These codes are displayed by the service aids, and when the diagnostic programs isolate a problem. For information about the location codes that are used by the using system, see the *Operator Guide* for the using system.

This section shows the location codes for the 7133.

```
A B - C D - E F G H - I J
```

Disk drive module slot number
1 through 16 (decimal)

Enclosure ID
(the four characters that appear in
the display at the front of the 7133)

Adapter position
(number of the slot, 1 through 8,
containing the SSA adapter)

System I/0 Bus identifier

Expansion adapter position

Expansion drawer
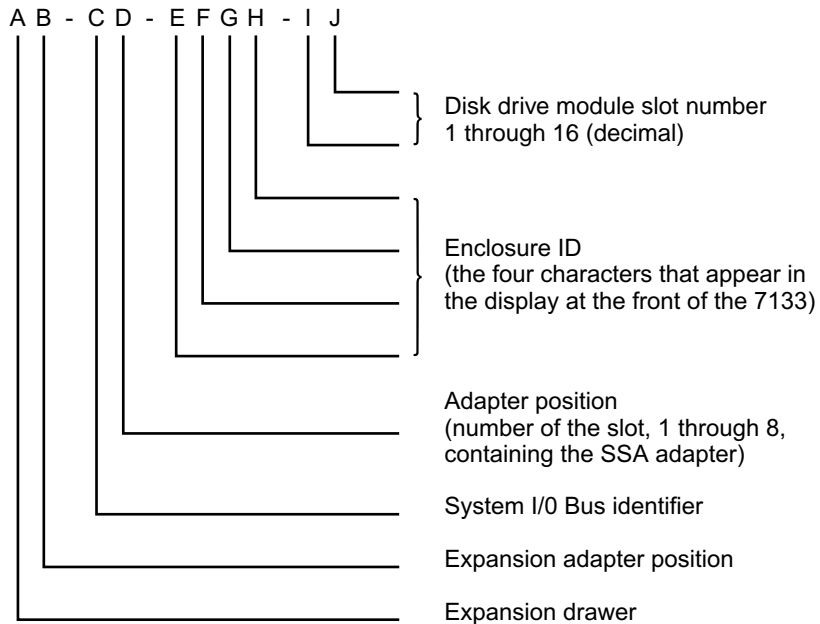
Pdisks, Hdisks, and Disk Drive Module Identification

The *physical* disk drives (**pdisks**) in an SSA subsystem can be configured as logical units (LUNs). A LUN is also known as an **hdisk**, and can consist of one or more physical disk drives. An hdisk in an SSA subsystem might, therefore, consist of one pdisk or several pdisks.

The configuration software also allocates an identification (hdisk and pdisk number) to each disk drive module during the configuration of the SSA loop. The disk drive modules do not have fixed physical addresses.

The numeric identifiers of pdisks, hdisks, and the disk drive module slots of a 7133 are not related to each other. For example, pdisk1 is not necessarily installed in slot 1 of the 7133.

The system software recognizes the disk drive module by a machine-readable number that is written on the electronics card of the disk drive module. This number is shown also on the label at the front of a disk drive module. The service aids show the number as the last eight digits of the IEEE 16-digit SSA unique identifier (UID).

Service actions are always related to physical disk drives. For this reason, errors that occur on SSA disk drives are always logged against the physical disk drive (pdisk).

If a disk drive that has been formatted on a machine of a particular type (for example, a Personal System/2) is later installed into a using system that is of a different type (for example, an RS/6000), that disk drive is configured only as a pdisk during the configuration of the using system.

Limitations:

1. Various types of 10 000 rpm disk drives are available. Their actual speeds are in the range 9 991 through 10 091 rpm.
2. If the customer configures an @server pSeries volume group on a 15+P RAID-5 array that is using 72.8 GB disk drives, the customer must set the form factor to 2 or above. This action allows the number of physical partitions to be set inside the AIX limit. If the customer does not do this action, the volume group fails to configure.
3. A pSeries RAID-0 volume group that uses 72.8 GB disk drives can contain no more than 15 of those disk drives.
4. On all disk drives, the adapter reserves 65 536 bytes for its own use.
5. Disk drive modules for 7133 Models 010, 020, 500, and 600 cannot be installed in 7133 Models D40 and T40. Also, disk drive modules for the 7133 Models D40 and T40 cannot be installed in 7133 Models 010, 020, 500, and 600.

Software and Microcode Errors

Some failures might be caused by software errors or by microcode errors. If you think you have a software or microcode error:

1. Ensure that your system software, controller microcode, and disk drive microcode are all at the latest levels. Information about the latest levels of software and microcode is given on the web support page (see "Web Support Pages" on page 254).
2. Make a note of all failure indicators: for example, the contents of error logs, or physical symptoms.
3. For AIX Versions 4.2 and above, run the **snap -b** command to collect system configuration data, and to dump data.

   For AIX versions below 4.2, go to the using-system service aids and select `Display Vital Product Data` to display the VPD of the failing system. Make a note of the VPD for all the SSA adapters and disk drives.
4. Report the problem to your support center. The center can tell you whether you have a known problem, and can, if necessary, provide you with a correction for the software or microcode.

Controller Card Microcode Maintenance

- To check the level of the controller microcode:

  1. Ensure that the **cfgmgr** command has been used to configure the enclosure (7133) since the previous change of microcode.

  2. Use the (AIX) Display Vital Product Data service aid to display the level of the controller microcode.

- The controller card microcode and the downloader (ssa_sesdld) are supplied with the disk drive microcode. They are usually stored in the /etc/microcode directory.

- Use the downloader utility ssa_sesdld to download the microcode.

- If you run the downloader with no parameters, it displays the required syntax.

Information about the latest levels of controller card microcode is given on the web support page (see Web Support Pages).

Downloading Disk Drive Microcode

To download disk drive microcode, use the Display/Download Disk Drive Microcode SSA service aid (see the chapter on SSA Service Aids in the *User's Guide and Maintenance Information* manual for your SSA adapter). Information about the latest levels of disk drive microcode is given on the web support page (see "Web Support Pages" on page 254).

Diagnostics Information

Note: If you were sent here from other instructions, return to those instructions when you have finished running the diagnostics.

Concurrent Diagnostics

When the instructions tell you to run concurrent diagnostics, run diagnostics (*not Advanced Diagnostics*) in:

- System Verification mode (see the using-system *Installation and Service Guide*) if you are verifying a repair or an upgrade
- Problem Determination mode (see the using-system *Installation and Service Guide*) if you think that a problem exists

Nonconcurrent Diagnostics

When the instructions tell you to run nonconcurrent diagnostics, run Advanced Diagnostics in:

- System Verification mode (see the using-system *Installation and Service Guide*) if you are verifying a repair or an upgrade
- Problem Determination mode (see the using-system *Installation and Service Guide*) if you think that a problem exists

Problems Corrected

Run Advanced Diagnostics in System Verification mode *only to the device that you have just repaired.* You can then enter information to prevent the generation of another SRN for the problem that you have just solved. If you do not enter that information, the errors that were previously logged for your problem might generate another SRN.

Displaying Link and Power Problems

Figure 141 shows an example screen that has been generated by the Link Verification SSA service aid.

```
LINK VERIFICATION                                                    802386

SSA Link Verification for:
  ssa0       00-04    SSA RAID Adapter


To Set or Reset Identify, move cursor onto selection, then press <Enter>

  Physical      Serial#     Adapter Port
                           A1  A2  B1  B2        Status

  pdisk5       5AEA0801     0   3               Good
  pdisk6       5AEA0808     1   2               Power
  pdisk2       5AEA0035     2   1               Good
  pdisk0       00025486     3   0               Good
  pdisk4       5AEA0479             0           Good
  pdisk3       5AEA0325             1           Good
  ?????
  pdisk1       2125DFHC                 1       Good
  pdisk8       5AEA0981                 0       Good



F3=Cancel            F10=Exit
```

Figure 141. Example Link Verification Screen

The question marks in the Physical column of the screen show that the SSA loop is broken between pdisk3 and pdisk1. Under these conditions, the Ready lights on pdisk3 and pdisk1 are both flashing.

Although you are servicing a 7133 Model D40 or Model T40, the screen might show a mixture of all models of 7133.

- For disk drives in 7133 Models 010, 020, 500, and 600, the word "Power" in the Status column of the screen shows that pdisk6 has detected a loss of redundant power or cooling.
- For disk drives in 7133 Models D40 and T40, the word "Power" in the Status column of the screen shows that pdisk6 is reporting an enclosure problem.

To help locate pdisk3, pdisk1, or pdisk6, select the pdisk and press Enter. The Check light on the selected pdisk flashes. This action does not affect the customer's operations.

If the loop contains a 7133 Model D40 or Model T40, you can also use the Physical Link Configuration service aid to provide additional information (see "Physical Link Configuration" on page 260).

For more information about the SSA service aids, see the chapter about SSA service aids in the *User's Guide and Maintenance Information* manual for your SSA adapter.

Service Aids

This section shows the screens for the service aids that are available when the 7133 is attached to a RISC system.

Physical Link Configuration

```
01 PHYSICAL LINK CONFIGURATION                                              xxxxx
02
03 SSA Link Configuration for:
04   severn:ssa0             00-05     SSA Network RAID Adapter
05
06   Link        Port       Device              Location      Port      Link
07
08                          severn:ssa0         00-05         A1
09                          pdisk9              00-05-P
10                          pdisk10             00-05-P
11                          pdisk11             00-05-P                   20-C
12   20-C        ||         pdisk12             R1E1-01                   40-I
13   40-I                   pdisk13             R1E1-02                   40-I
14   40-I                   pdisk14             R1E1-03                   40-I
15   40-I                   pdisk15             R1E1-04       >>          40-I
16   40-I        >>         pdisk16             R1E1-05                   40-I
17   40-I                   pdisk17             R1E1-06                   40-I
18   40-I                   pdisk18             R1E1-07       ||||        40-0
19   40-0        A1         trent2:****                       A2         40-C
    ??????????????????????????????????????????????????????????????????????????
     NONE        0000       ****                FRED-09                   40-I
     40-I                   pdisk30             FRED-10       >>>>        40-I
     40-I        >>>>       pdisk19             FRED-13                   40-I
     40-I                   pdisk20             FRED-14
     40-I                   pdisk21             FRED-15       ||          40-C
     40-C        A2         severn:ssa0         00-05

                            severn:ssa0         00-05         B1
     40-C        ||         pdisk22             R1E1-09                   40-I
     40-I                   pdisk23             R1E1-10                   40-I
     40-I                   pdisk24             R1E1-11                   40-I
     40-I        >>         pdisk25             R1E1-12       ||          40-C
     40-C        B2         severn:ssa0         00-05
23
24   F3=Cancel        F10=Exit
25
```

Lines 7 through 22 are selectable and scrollable.

Keys to Use
- Press Enter to display the legend as a popup menu.
- Press the Cancel key to return to the Adapter Selection menu.
- Press the Exit key to return to the Service Aid Selection menu.

Legend for Screen Symbols
****   Unknown disk drive or adapter.

‖   Inline mode.

‖‖   Forced Inline mode.

>>   Automatic mode.

>>>>   Forced Bypass mode.

OOOO   Forced Open mode.

NONE   No connection.

20-C   20 MB per second copper cable.

40-C   40 MB per second copper cable.

40-I   40 MB per second internal link.

40-O   40 MB per second optical link.

??????
     Break in the SSA loop.

Enclosure Configuration

```
01 ENCLOSURE CONFIGURATION                                              XXXXXX
02
03 SSA Enclosure Configuration for:
04   R1E1      Enclosure 1        SSA Enclosure
05
06   Conn     Port     Link     Device                  Location        Exchanged
07
08   20-C      1        ||       BYPASS
09                               severn:pdisk01             01               X
10                               severn:pdisk02             02
11                               severn:pdisk03             03
12                               severn:pdisk04             04
13             4        >>       BYPASS
14             5        >>       BYPASS
15                               severn:pdisk05             05
16                               severn:pdisk06             06
17                               DDDD                       07
18                               severn:pdisk07             08               X
19   40-C      8        ||       BYPASS
20             9        0000     BYPASS
                                 DDDD                       09
                                 DDDD                       10
                                 DDDD                       11
                                 ----                       12
              12        0000     BYPASS
     40-0     13        ||||     BYPASS
                                 SSA Disk                   13
                                 SSA Disk                   14
                                 ---                        15
                                 SSA Disk                   16
     40-0     16        ||||     BYPASS
23
24   F3=Cancel         F10=Exit
25
```

Lines 7 through 22 are selectable and scrollable.

Keys to Use
- Press Enter to display the legend as a popup menu.
- Press the Cancel key to return to the Enclosure Selection (configuration) menu.
- Press the Exit key to return to the Service Aid Selection menu.

Legend for Screen Symbols

X   "Exchanged" flag. When set, this flag indicates that the FRU has been
           removed and reinstalled, or exchanged for a new FRU, since the flag was last
           reset.

– – – – No disk drive module.

DDDD   Dummy disk drive module.

BYPASS
　　　　SSA node bypass card.

||　　　Inline state.

||||　　Forced Inline state.

>>　　　Bypass state.

>>>>　　Forced Bypass state.

OOOO　Forced Open state.

20-C　　20 MB per second copper cable.

40-C　　40 MB per second copper cable.

40-I　　40 MB per second internal link.

40-O　　40 MB per second optical link.

SSA Disk
　　　　Unconfigured disk drive.

Enclosure Environment

```
01 ENCLOSURE ENVIRONMENT                                    XXXXXX
02
03 SSA Enclosure Environment for:
04   R1E1     Enclosure 1     SSA Enclosure
05
06  Enclosure Element                       Status
07
08  Power Unit 1                            Good
09  Power Unit 2                            Fault (exchanged)
10
11  Fan Unit 1                              Good
12  Fan Unit 2                              Good
13  Fan Unit 3                              Fault
14
15  Operator Panel                          Not Present
16
17  Remote Power Off Module (RPO)           Good
18
19  Ambient Temperature (degrees Celsius)   35
20
21  Controller                              Fault
22
23
24  F3=Cancel       F10=Exit
25
```

Note: In this screen, the word "exchanged" indicates that the FRU has been removed and reinstalled, or exchanged for a new FRU, since the "Exchanged" flag was last reset.

Keys to Use
- Press Enter to return.
- Press the Cancel key to return to the Enclosure Selection (environment) menu.
- Press the Exit key to return to the Service Aid Selection menu.

Enclosure Settings

```
2 01│ENCLOSURE SETTINGS
3 02│
4 03│Move cursor onto selection, then press <Enter>
5 04│
6 05│  ID DISPLAY
7 06│  BYPASS MODES
8 07│  TEMPERATURES WARNING
9 08│  COMPONENT EXCHANGED FLAGS
0 09│  DRIVE EXCHANGED FLAGS
1 10│
2 11│
3 12│
4 13│
5 14│
6 15│
7 16│
8 17│
9 18│
0 19│
1 20│
2 21│
3 22│
4 23│
5 24│  F3=Cancel      F10=Exit
6 25│
```

Lines 6 through 22 are selectable.

Keys to Use
- Press Enter to go to the selected menu.
- Press the Cancel key to return to the Enclosure Selection (settings) menu.
- Press the Exit key to return to the Service Aid Selection menu.

Command Line Tools

ssaencl Command

Purpose

To allow the monitoring and changing of the status for SSA SES disk enclosures (subsystems).

Syntax

To display enclosure component settings:

```
ssaencl -l name
                [-s]
                [-v]
                [-i]
                [-r]
                [-b[card ...]]
                [-t[threshold ...]]
                [-a]
                [-f[fan ...]]
                [-d[drive_bay ...]]
                [-p[PSU ...]]
                [-o]
                [-c]
```

To modify enclosure component settings:

```
ssaencl -l name
                [-I ID [-U]]
                [-B mode | card=mode ...]
                [-S {d[drive_bay ...] | b[card ...] | p[PSU
                 ...] | r | c | o }]
                 [-T threshold=value ...]
```

For help, type: ssaencl -? or ssaencl -h

Description

The **ssaencl** command can be used to observe the existing settings of an SSA SES disk enclosure (subsystem), or to modify the settings of that enclosure. The command can be used only to observe **or** modify settings; it cannot be used to observe **and** modify settings at the same time.

When the command displays enclosure settings, it displays them in tables that the user can read easily. If the -s flag is specified, however, the command displays the settings in colon-separated format, as used by commands such as the SMIT commands.

Flags

-l name

Specifies the name of an SSA SES enclosure or pdisk. If a pdisk name is used, that pdisk must be in an SSA SES enclosure.

-s   Displays output in colon-separated format.

-v   Displays also VPD information.

-i   Displays the enclosure identifier (as shown in the operator panel, if present).

-r   Displays "RPO present TRUE/FALSE" (RPO is the remote power-on control).

-b [card]
Displays the status of the bypass cards. If no parameters are given, the status for all the bypass cards is displayed. Valid values for the **[card]** parameter are: 1, 4, 5, 8, 9, 12, 13, 16.

-t [threshold]
Displays all the temperature thresholds, or only the specified temperature thresholds. The valid values for the **[threshold]** parameter are:
lowarn   The low-temperature warning threshold.
locrit   The low-temperature critical threshold.
hiwarn   The high-temperature warning threshold.
hicrit   The high-temperature critical threshold.

-a   Displays the ambient temperature of the enclosure and temperature threshold statuses.

-f [fan] Displays the status of all the fans, or of only the specified fans. Valid values for the **[fan]** parameter are: 1, 2, 3, and so on.

-d [drive_bay]
Displays the status of all the disk drive bays (slots), or of only the specified disk drive bays. Valid values for the **[drive_bay]** parameter are: 1, 2, 3, and so on.

-p [PSU]
Displays the status of all the power supply assemblies, or of only the specified power supply assemblies. Valid values for the **[PSU]** parameter are 1, 2.

-o   Displays the status of the operator panel.

-c   Displays the status of the controller card.

-I ID[-U]
Modifies the enclosure ID. The ID must be a four-character alphanumeric string. The optional -U flag causes the object data manager (ODM) to be updated to show the change.

-B mode
Modifies all bypass cards to the given mode.

-B card=mode

> Modifies the specified bypass cards to be in the given modes. The valid values for the **mode** parameter are:
> - Automatic
> - Bypass
> - Inline
> - Open
>
> Valid values for the **card** parameter are 1, 4, 5, 8, 9, 12, 13, 16.

-S   Resets the "exchanged" flag of the selected FRU.

-S d[drive_bay ...]

> Resets the flag for the selected drive bay. Valid values for drive_bay are 1, 2, 3, and so on.

-S b[card ...]

> Resets the flag for the bypass card. Valid values for card are 1, 4, 5, 8, 9, 12, 13, 16.

-S p[PSU ...]

> Resets the flag for the selected PSU. Valid values for PSU are 1, 2.

-S r   Resets the flag for the remote power-on control (RPO).

-S c   Resets the flag for the controller card.

-S o   Resets the flag for the operator panel.

-T threshold=value

> Modifies the specified temperature thresholds to the given values. The valid values for the **[threshold]** parameter are:
> lowarn   The low-temperature warning threshold.
> hiwarn   The high-temperature warning threshold.
>
> The **value** parameter is a temperature in degrees C.

Examples

- To display the status of all bypass cards on enclosure0, give the command:

  ```
  ssaencl -l enclosure0 -b
  ```

- To display the status and VPD of the controller card in enclosure0, give the command:

  ```
  ssaencl -l enclosure0 -c -v
  ```

- To modify the ID for enclosure0 to R2D2, give the command:

  ```
  ssaencl -l enclosure0 -I R2D2
  ```

- To display the contents of disk bay (slot) 8 in enclosure0, give the command:

  ```
  ssaencl -l enclosure0 -d 8
  ```

Disk Drive Modules in Use

1. If you are removing the disk drive module under concurrent maintenance (see "Concurrent Maintenance" on page 137), first ensure that no hdisk is using the pdisk (disk drive module) that you want to remove. Use the Configuration Verification service aid (see the chapter about service aids in the *User's Guide and Maintenance Information* manual for your SSA adapter) to determine whether the pdisk is related to an hdisk.

2. If the pdisk is related to an hdisk that is a RAID array, go to step 3.

   If the pdisk is related to an hdisk that is not a RAID array, make that hdisk unavailable to the using system, and go to step 6 on page 150.

   Note: Making an hdisk unavailable is usually a responsibility of system administration.

   If the pdisk is not related to an hdisk, go to step 6 on page 150.

3. For fast path, type `smitty redssaraid` and press Enter.

   Otherwise:

   a. Select **Change Member Disks in an SSA RAID Array** from the SSA RAID Array menu.

   b. Select **Remove a Disk from an SSA RAID Array**.

4. A list of arrays is displayed in a window:

```
                    Change Member Disks in an SSA RAID Array

Move cursor to desired item and press Enter.

   Remove a Disk from an SSA RAID Array
   Add a Disk to an SSA RAID Array
   Swap Members of an SSA RAID Array




     --------------------------------------------------------------------
    |                           SSA RAID Array                           |
    |                                                                    |
    | Move cursor to desired item and press Enter.                       |
    |                                                                    |
    |   hdisk3          095231779F0737K good      3.4G   RAID-5 array    |
    |   hdisk4          09523173A02137K good      3.4G   RAID-5 array    |
    |                                                                    |
    | F1=Help              F2=Refresh            F3=Cancel               |
    | F8=Image             F10=Exit              Enter=Do                |
    | /=Find               n=Find Next                                   |
     --------------------------------------------------------------------
```

Select the SSA RAID array from which you are removing the disk drive module.

5. The following information is displayed:

```
                   Remove a Disk from an SSA RAID Array

  Type or select values in entry fields.
  Press Enter AFTER making all desired changes.

                                                  Entry Fields
    SSA RAID Manager                              ssa0
    SSA RAID Array                                hdisk3
    Connection Address / Array Name               095231779F0737K
  * Disk to Remove                                                        +










  F1=Help            F2=Refresh         F3=Cancel         F4=List
  F5=Reset           F6=Command         F7=Edit           F8=Image
  F9=Shell           F10=Exit           Enter=Do
```

Press F4 to list the disk drive modules.

6. A list of disk drive modules is displayed.

If the disk drive module, or modules, that you want to remove is in the list, select the module, or modules, from the list, then go to step 6 on page 150.

If any disk drive module that you want to remove is not in the list:

a. Run the Link Verification service aid (see the chapter about service aids in the *User's Guide and Maintenance Information* manual for your SSA adapter).

b. Check whether the SSA loop is broken.

c. If the SSA loop is broken, go to step 6d.

If the SSA loop is not broken, go to step 9 on page 151.

d. Check whether the SSA loop is broken only at the disk drive module that you want to remove.

If the SSA loop is broken only at that position, go to step 9 on page 151.

If the SSA loop is broken somewhere else, close down the using system (see the *Installation and Service Guide* for the using system), then go to step 9 on page 151.

Configuring a Disk Drive Module to the Using System

1. Use the **cfgmgr** command to configure all new devices.

2. The disk drive has been configured with *new* hdisk and pdisk numbers. You can change these numbers. For example, if the disk drive module is a replacement module, you might want to make its pdisk and hdisk numbers match those of the original module.

   If you want to change the numbers, go to step 3.

   If you do not want to change the numbers, and you came to this section from a step in a MAP, return to that step, and continue with the MAP. Otherwise, go no further with these instructions.

3. Do steps 3a through 3h for *each* using system that is in the SSA loop on which you are now working.

   a. Run the Configuration Verification service aid (see the chapter about SSA service aids in the *User's Guide and Maintenance Information* manual for your SSA adapter).

   b. From the displayed list of pdisks and hdisks, find the serial number of the disk drive module that you have just installed.

   c. The serial number is shown twice: next to the new pdisk number and next to the new hdisk number.

      Make a note of the new pdisk and hdisk numbers.

   d. If the disk drive module that you are installing is a replacement for a module that was a member of an SSA RAID array, go to step 3e. Otherwise, go to step 5.

   e. Type `smitty ssaraid` and press Enter.

   f. Select **Change/Show Use of an SSA Physical Disk**.

      The pdisk that has been exchanged is listed under **SSA Physical Disks that are system disks**.

   g. Select the pdisk from the list.

   h. Change the Current Use parameter to **Hot Spare Disk** or to **Array Candidate Disk**.

      Note: It is the user who should make the choice of Current Use parameter. That choice should be:

      - **Hot Spare Disk** if the use of hot spares is enabled for the RAID arrays on the subsystem

      - **Array Candidate Disk** if the use of hot spares is disabled for the RAID arrays on the subsystem.

4. You have now finished installing the disk drive module. Go no further with these instructions. If you came to this section from a step in a MAP, return to that step, and continue with the MAP.

5. Give the following command:

   `lsdev -Cl [hdisknumber] -Fconnwhere`

   where [`hdisknumber`] is the new hdisk number (for example, hdisk12).

6. The hdisk connection location number [connwhere] is displayed (for example, 0004AC5119E000D). Make a note of this number; you will need it later in this procedure.

7. Remove the new hdisk number by giving the command:

   rmdev -l [hdisknumber] -d

   where [hdisknumber] is the hdisk number that you want to remove (for example, hdisk12).

8. Remove the definition of the *original* hdisk by giving the command:

   rmdev -l [hdisknumber] -d

   where [hdisknumber] is the hdisk number of the original disk drive module (for example, hdisk7).

9. Give the command:

   mkdev -p ssar -t hdisk -c disk -s ssar -w [connwhere] -l [hdisknumber]

   where [connwhere] is the connection location number that you noted in step 6, and [hdisknumber] is the hdisk number you want for the new disk drive module (for example, hdisk7).

10. If you want to remove, from the system configuration, pdisk numbers that are not used, give the following command for pdisks that remain defined:

    rmdev -l [pdisk] -d

    where [pdisk] is the number of the pdisk that you want to remove from the configuration.

Configuring a 7133 to the Using System

Use the **cfgmgr** command to configure or reconfigure a 7133 Model D40 or Model T40 to the using system.

Unconfiguring a 7133 from the Using System

To remove a 7133 Model D40 or Model T40 from the using system, give the following command:

rmdev -l [enclosurenumber] -d

where [enclosurenumber] is the enclosure device that was generated by the **cfgmgr** command (for example, [enclosure0], [enclosure1], [enclosure2]).

MAP Extension

Step 1. (from MAP 2010: 7133 Models D40 and T40 – START step 7 on page 90)

Have you been sent to this MAP from the Configuration Verification service aid?

NO   Go to step 2.

YES   Go to step 3.

Step 2. (from step 1)

Have you been sent to this MAP from the Link Verification service aid?

NO   Go to step 3.

YES   The SSA adapter has not found any pdisks that are in the "Available" state.

Either no disk drives are connected to the SSA adapter, or a loop configuration that is not valid has been detected. See "SSA Subsystem Configurations" on page 47 and the rules for SSA loops in the *User's Guide and Maintenance Information* manual for your SSA adapter.

Step 3. (from steps 1 and 2)

Are you at this MAP because you have found an hdisk that has no associated pdisk?

NO   Go to step 4.

YES

    a. Give the **cfgmgr** command.

    b. Run the Configuration Verification service aid again.

    c. If the problem remains, a software error has probably occurred. Call your support center for assistance.

Step 4. (from step 3)

Are you at this MAP because you have found a pdisk that has no associated hdisk?

NO   Go to step 8 on page 90 in MAP 2010: 7133 Models D40 and T40 – START.

YES

    a. Run diagnostics in System Verification mode to the pdisk.

    b. When the diagnostics have completed, go to step 11 on page 90 in MAP 2010: 7133 Models D40 and T40 – START.

Appendix B. Additional Information for PC Servers

This appendix provides information that is specific to 7133 Models D40 and T40 that are attached to PC servers.

Related Publications

- *IBM PC Servers: IBM® SSA RAID Cluster Adapter: Hardware Maintenance Manual Supplement*, S96H-9840
- *IBM PC Servers: IBM SSA RAID Adapter for PC Servers: Hardware Maintenance Manual Supplement*, S32H-3817
- *IBM PC Servers: IBM SerialRAID Adapter: Hardware Maintenance Manual Supplement*, SY33-0193
- *IBM PC Servers: IBM Advanced SerialRAID/X Adapter: Installation and User's Guide and Maintenance Information*, SA33-3288
- *IBM Netfinity Rack: Planning and Installation Guide*, S24L-8055

Are You Using the Correct Book? *Do not use this book if you are servicing a 7133 Model 010, 020, 500, or 600 SSA Disk Subsystem.* For those models, use the *IBM 7133 SSA Disk Subsystem for PC Servers: Hardware Maintenance Manual Supplement,* S96H-9764-00.

Web Support Pages

When you are installing an SSA device or subsystem, upgrading your SSA subsystem, or doing preventive maintenance on your SSA subsystem, refer to the web pages that are listed here. Refer to these pages also if you are upgrading your system hardware or operating system, and the system contains SSA devices. These web pages provide access to the latest SSA publications and support-microcode for the using system, SSA adapters, and SSA subsystem.

http://www.hursley.ibm.com/ssa/

This web page provides links to SSA publications and other web pages, including the other web page in this list.

http://www.hursley.ibm.com/ssa/pcserver/

This web page contains a list of the latest levels of SSA support microcode, and provides a microcode download capability for PC server environments.

Location Code Format

When disk drive errors are logged in the SSA error log, or displayed during error log analysis, they include a related location code. The format of the location code is

NNNN-XX

where NNNN is the enclosure ID; that is the four characters that appear in the display at the front of the 7133, and XX is the number of the disk drive module slot.

Software and Microcode Errors

Some failures might be caused by software errors or by microcode errors. If you think you have a software or microcode error:

1. Ensure that your system software, controller microcode, and disk drive microcode are all at the latest levels. Information about the latest levels of software and microcode is given on the web support page (see "Web Support Pages" on page 276).

2. Make a note of all failure indicators: for example, the contents of error logs, or physical symptoms.

3. Go to the using-system service aids to display the VPD of the failing system. Make a note of the VPD for all the SSA attachments, SSA subsystems, 7133s, and disk drive modules.

4. Report the problem to your support center. The center can tell you whether you have a known problem, and can, if necessary, provide you with a correction for the software or microcode.

Controller Card Microcode Maintenance

- To check the level of the controller microcode:
  1. Start the SSA Remote Systems Management function.
  2. Select **Enclosure View**.
  3. Click on the Check Code button.
- Use the downloader utility issasdld to download the microcode.
- If you run the downloader with no parameters, it displays the required syntax.

Information about the latest levels of controller card microcode is given on the web support page (see Web Support Pages).

Downloading Disk Drive Microcode

To download disk drive microcode, follow the instructions given under "Download Microcode Function" in the user and service information for your SSA adapter.

Diagnostics Information

> **Note:** If you were sent here from other instructions, return to those instructions when you have finished running the diagnostics.

Concurrent Diagnostics

1. Start the SSA Remote Systems Management function.
2. Select the device; that is, adapter, disk drive module, or enclosure (subsystem).
3. Click on the **CDiagnostics** button.

Nonconcurrent Diagnostics

1. Start the SSA Remote Systems Management function.
2. Select the device; that is, adapter, disk drive module, or enclosure (subsystem).
3. Click on the **NonCDiagnostics** button.

Problems Corrected

1. Start the SSA Remote Systems Management function.
2. Select **SSA Adapter List**.
3. Click on the **Event Logger** button.
4. Click on the **Analyze** button.
5. Click on the appropriate Select boxes for the devices that you want to "Fix".
6. Click on the **Fix** button.

Displaying Link and Power Problems

1. Start the SSA Remote Systems Management function.
2. Select **SSA Adapter List**.
3. Select the adapter that you want to inspect.
4. Select **SSA Physical View**.
5. See whether the Break symbol is displayed. This symbol indicates that the SSA loop is broken at that point. Under this condition, the SSA devices on each side of the break are flashing their status lights.
6. See whether the word "Power " is displayed in the status column. Although you are servicing a 7133 Model D40 or Model T40, the screen might show a mixture of all models of 7133.

   - For disk drives in 7133 Models 010, 020, 500, and 600, the word "Power" in the Status column of the screen shows that this particular disk drive module has detected a loss of redundant power or cooling.

   - For disk drives in 7133 Models D40 and T40, the word "Power" in the Status column of the screen shows that this particular disk drive module is reporting an enclosure problem.

Service Aids

All service aids for PC servers are provided by the Remote Systems Management (RSM) configurator, which is supplied with the SSA adapter.

The RSM configurator is a Web Browser utility. It contains online help, and gives access, locally and remotely, to the following subsystem functions:

- Configuration functions that allow you to:
  - Configure SSA disk drive modules to the using (host) system (see the user and service information for your SSA adapter)
  - Configure, create, and delete SSA RAID arrays (see the user and service information for your SSA adapter)
- Error log analysis (see the user and service information for your SSA adapter)
- Service functions

The service functions that the RSM configurator provides for a selected adapter are:
- Display a Logical View of the SSA network
- Display a Physical View of the SSA network
- View a selected 7133 Model D40 or Model T40 enclosure
- Check all microcode levels

The Enclosure View provides the following enclosure functions:
- Display:
  - ID (name) of the enclosure
  - FRUs that are installed
  - VPD of each FRU
  - Status of each FRU:
    - Fault bit
    - Exchange or Swap bit
    - Connection type (for example, bypass cards)
  - Ambient temperature
  - Warning-temperature settings
  - Physical position of each disk drive module
  - Mode and state of each bypass card
- Modify:
  - ID (name) of the enclosure
  - Warning-temperature settings
  - Mode of each bypass card

Command Line Tools

Not applicable to PC servers.

Disk Drive Modules in Use

1. If the disk drive module that is to be removed is a member of an array, use the functions of the SSA Configurator and Service Aids Utility to remove the disk drive module from the array (see the service information for your SSA adapter).
2. Return to the procedure that sent you here.

Configuring a Disk Drive Module to the Using System

A new resource is a disk drive or array that has not been used previously in this system. For example, a new disk drive for use in the PC might be one that has arrived direct from the factory, or one that has been used previously in an AIX system. Under these conditions, the disk drive has a flag set to indicate that it is for use in an AIX system. Before the PC can use the disk drive, the flag must be reset. To reset the flag, convert the new disk drive to a free resource (see the service information for your SSA adapter).

When the flag has been reset, the new disk drive becomes a free resource. The disk drive is deleted from the list of new disk drives, and added to the list of system resources. Free resources can be managed by the PC operating system, and assigned to specific uses, such as hot spare disk drives, or member disk drives of RAID arrays.

Configuring a 7133 to the Using System

The 7133 is not configured to PC systems. All communications that are related to error logging and vital product data (VPD) collection are made direct to the 7133.

Unconfiguring a 7133 from the Using System

Not applicable for PC servers.

MAP Extension

Not applicable for PC servers.

Index

Special characters

Numerics

A

B

C

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