

7133 Models D40 and T40  
Serial Disk Systems

# Service Guide



7133 Models D40 and T40  
Serial Disk Systems

# Service Guide

#### **Fourth Edition (May 1999)**

This major revision supersedes GY33-0192-02. Technical changes are shown by a vertical line to the left of each change.

**The following paragraph does not apply to any country where such provisions are inconsistent with local law:** THIS PUBLICATION IS PRINTED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions; therefore, this statement may not apply to you.

This publication could contain technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication.

It is possible that this publication may contain reference to, or information about, products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that such products, programming, or services will be offered in your country. Any reference to a licensed program in this publication is not intended to state or imply that you can use only the licensed program indicated. You can use any functionally equivalent program instead.

**© Copyright International Business Machines Corporation 1998, 1999. All rights reserved.**

Note to U.S. Government Users — Documentation related to restricted rights — Use, duplication, or disclosure is subject to restrictions set forth in the GSA ADP Schedule Contract.

---

# Contents

<b>Communications Statements</b>	ix
Federal Communications Commission (FCC) Statement	ix
Japanese Voluntary Control Council for Interference (VCCI) Statement	ix
Korean Government Ministry of Communication (MOC) Statement	ix
New Zealand Compliance Statement	ix
International Electrotechnical Commission (IEC) Statement	x
Avis de conformité à la réglementation d'Industrie Canada	x
Industry Canada Compliance Statement	x
United Kingdom Telecommunications Requirements	x
European Union (EU) Statement	x
Radio Protection for Germany	x
Taiwan Class A Compliance Statement	xi
<b>Safety Notices</b>	xiii
Definitions of Safety Notices	xiii
Safety Notice for Installing, Relocating, or Servicing	xiii
Laser Safety Information	xiv
<b>About This Book</b>	xv
Numbering Convention	xv
Trademarks	xv
Related Publications	xvi
<b>Chapter 1. Reference Information</b>	1
Controller Card	3
SSA Loops and Links	3
Advanced SSA Optical Extender (Pair) Feature	4
Remote Power On Control Feature	4
–48 Volt Power Supply (Model D40 Only)	4
Lights and Controls	5
Operator Panel Lights and Controls	7
Disk Drive Status Lights	12
Controller Card Light	12
Fan Assembly Lights	12
Power Supply Assembly Lights and Controls	12
Bypass Card Lights	13
Disk Drive Module Lights	15
Other 7133 Settings	16
Parts Locations	17
Parts Locations (Model D40)	18
Parts Locations (Model T40)	20
Remote-Power-On Control Unit and Cables	22
Advanced SSA Optical Extenders and Fibre Optic Cables	23
Single-Mode Configuration	23
Multi-Mode Configuration	25
Specifications for Fibre Optic Cables and Connectors	27
Optical Extender Lights	27

Connectors . . . . .	28
Back Connectors (Model D40). . . . .	28
Internal Connections (Model D40) . . . . .	29
Back Connectors (Model T40). . . . .	30
Internal Connections (Model T40) . . . . .	31
SSA Connectors . . . . .	32
Mainline-Power Connector (Model D40, 220 V ac/dc) . . . . .	33
Mainline-Power Connector (Model D40, -48 V dc) . . . . .	33
Mainline-Power Connector (Model T40). . . . .	34
Internal Power Connector (Model T40) . . . . .	34
Remote-Power-On Control Unit Connectors and Switch . . . . .	35
Power Distribution Schematic . . . . .	36
Labels . . . . .	37
Product Characteristics . . . . .	39
Dimensions and Weight (Model D40) . . . . .	39
Dimensions and Weight (Model T40) . . . . .	39
AC and DC Input-Voltage Requirements . . . . .	39
Environment . . . . .	39
Altitude . . . . .	40
Heat Output (Maximum). . . . .	40
Sizes of Disk Drive Modules . . . . .	40
Power Sequencing . . . . .	40
Disk Drive Acclimation . . . . .	41
SSA Bypass Cards . . . . .	41
Automatic Mode . . . . .	41
Forced Inline Mode . . . . .	43
Forced Bypass Mode. . . . .	44
Forced Open Mode . . . . .	44
Resetting Bypass Card Modes . . . . .	44
Bypass Card Jumpers . . . . .	45
SSA Subsystem Configurations . . . . .	47
Rules for SSA Loops . . . . .	47
Cable Configurations . . . . .	47
Larger Configurations . . . . .	49
SSA Cables for 7133 Models D40 and T40 . . . . .	55
Preventing the Isolation of Disk Drives in Higher-Availability Configurations . . . . .	57
Physical Location of a Device . . . . .	59
Finding the Device When Service Aids Are Available . . . . .	59
Additional Device Location Information . . . . .	59
Controller Card Microcode Maintenance . . . . .	60
Disk Drive Microcode Maintenance . . . . .	60
Vital Product Data (VPD) . . . . .	61
SSA Disk Drives . . . . .	61
7133 Models D40 and T40 . . . . .	61
Service Functions . . . . .	62
7133 Models D40 and T40 Service Aids . . . . .	62
Service Inspection Guide . . . . .	64
Inspection Checklist . . . . .	64
Checking the Grounding of the 7133 . . . . .	65
Grounding Check (Model D40) . . . . .	65

Grounding Check (Model T40).	69
<b>Chapter 2. Problem Determination Procedures</b>	<b>73</b>
Disk Drive Module Power-On Self-Tests (POSTs)	73
Controller Card Power-On Self-Tests (POSTs)	74
Service Request Numbers (SRNs)	75
The SRN Table.	75
Using the SRN Table.	75
FRU Names Used in the SRN Table.	76
The SRNs	77
Maintenance Analysis Procedures (MAPs).	86
How to Use these MAPs	86
MAP 2010: 7133 Models D40 and T40 – START	87
MAP 2020: 7133 Models D40 and T40 – Power	95
MAP 2022: 7133 Models D40 and T40 – Power-On	99
MAP 2030: 7133 Models D40 and T40 – Remote Power On Control Feature	103
MAP 2330: 7133 Models D40 and T40 – Optical Extender	109
MAP 2410: 7133 Models D40 and T40 – Repair Verification	132
SSA Link Errors	134
Resetting Bypass Card Modes	134
SSA Link Error Problem Determination	134
Link Status (Ready) Lights	136
Optical Extender Lights	138
Displaying Link Problems	138
<b>Chapter 3. Removal and Replacement Procedures</b>	<b>139</b>
Concurrent Maintenance	139
Covers	141
Operator Panel Flap	141
Front Cover (Model D40)	142
Front Cover (Model T40)	144
Back Cover (Model T40)	145
All Power	146
Power (Model D40)	147
Power (Model T40)	149
Disk Drive Modules	151
Removing a Module.	151
Installing a Module	157
Dummy Disk Drive Modules	168
Removing a Dummy Module	168
Installing a Dummy Module	174
Power Supply Assemblies.	178
Removing a Power Supply Assembly	178
Installing a Power Supply Assembly	183
Fan Assemblies	188
Operator Panel and Disk Drive Status Light Assemblies, Flexible Circuits, and	
Front Bezel Assembly	190
ESD Cover (Model D40)	191
Operator Panel Assembly (Model D40)	193
Operator Panel Flexible Circuit (Model D40).	195

Disk Drive Status Lights Assembly (Model D40)	197
Front Bezel Assembly (Model T40)	199
Operator Panel Assembly and Operator Panel Flexible Circuit (Model T40)	203
Disk Drive Status Lights Assembly (Model T40)	204
Power Switch and Cable Assembly (Model T40)	205
Controller Card Assembly	207
Bypass (SNBC) Cards	209
Remote-Power-On Control Unit	212
Remote-Power-On Control Unit (Model D40)	212
Remote-Power-On Control Unit (Model T40)	214
Frame Assembly	216
Model D40 in an RS/6000 Rack	218
Model D40 in a Netfinity Rack	221
Model T40	224
Removing a 7133 Model D40 from a Rack	227
Model D40 in an RS/6000 Rack	229
Model D40 in a Netfinity Rack	232
Support Rails	235
RS/6000 Support Rails	235
Netfinity Support Rails	238
<b>Chapter 4. Parts Catalog</b>	<b>243</b>
Conventions	243
7133 Model D40	244
7133 Model T40	247
Country Power Cables	250
<b>Appendix A. Additional Information for RISC Systems</b>	<b>251</b>
Related Publications	252
Web Support Pages	252
Addressing SSA Disk Drives	253
Location Code Format	253
Pdisks, Hdisks, and Disk Drive Module Identification	253
Software and Microcode Errors	254
Controller Card Microcode Maintenance	255
Downloading Disk Drive Microcode	256
Diagnostics Information	256
Concurrent Diagnostics	256
Nonconcurrent Diagnostics	256
Problems Corrected	256
Displaying Link and Power Problems	257
Service Aids	259
Physical Link Configuration	259
Enclosure Configuration	260
Enclosure Environment	262
Enclosure Settings	263
Command Line Tools	264
ssaencl Command	264
Disk Drive Modules in Use	267
Configuring a Disk Drive Module to the Using System	269



Configuring a 7133 to the Using System . . . . .	270
Unconfiguring a 7133 from the Using System . . . . .	270
MAP Extension . . . . .	271
<b>Appendix B. Additional Information for PC Servers . . . . .</b>	<b>273</b>
Related Publications . . . . .	273
Web Support Pages. . . . .	274
Location Code Format . . . . .	275
Software and Microcode Errors . . . . .	275
Controller Card Microcode Maintenance . . . . .	275
Downloading Disk Drive Microcode. . . . .	275
Diagnostics Information . . . . .	276
Concurrent Diagnostics . . . . .	276
Nonconcurrent Diagnostics . . . . .	276
Problems Corrected. . . . .	276
Displaying Link and Power Problems . . . . .	276
Service Aids . . . . .	277
Command Line Tools . . . . .	277
Disk Drive Modules in Use . . . . .	278
Configuring a Disk Drive Module to the Using System . . . . .	278
Configuring a 7133 to the Using System . . . . .	278
Unconfiguring a 7133 from the Using System . . . . .	278
MAP Extension . . . . .	278
<b>Index . . . . .</b>	<b>279</b>



---

## **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.

---

## 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 148 and 182.

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 218, 219, 221, 222, 225, 228, 229, 231, 232, and 234.

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.

---

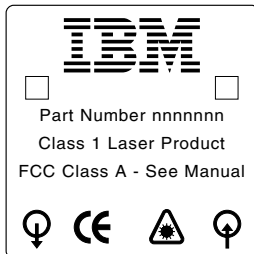
## Laser Safety Information

### 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.



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

---

## 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 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 desktop unit.

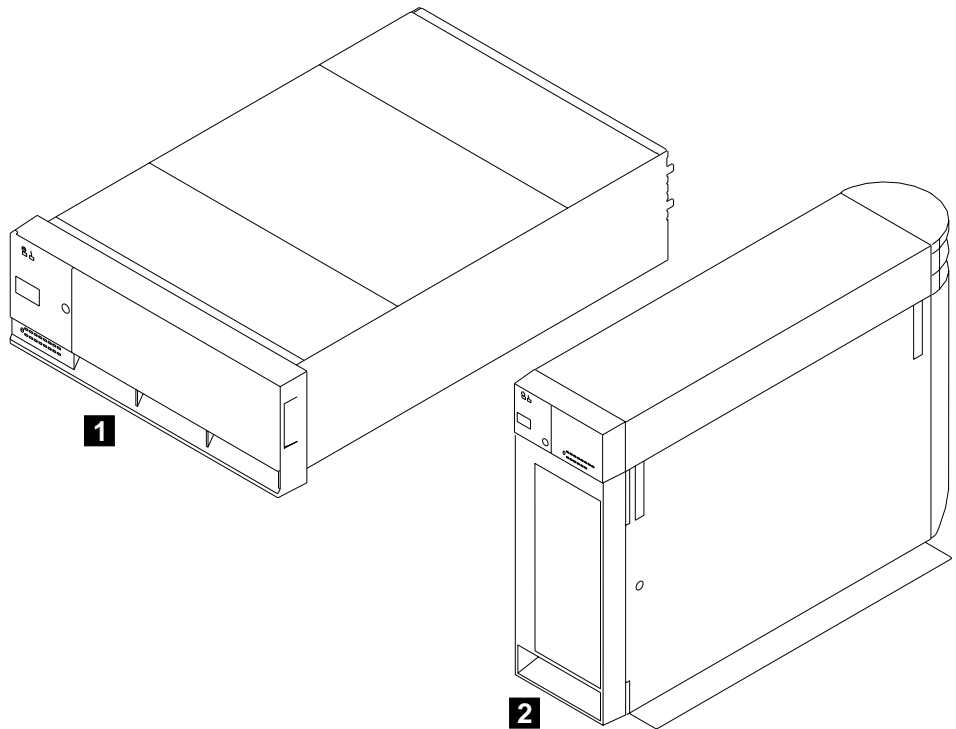


Figure 1. 7133 Models D40 and T40

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 139.

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 23 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 22.

---

## –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:

- If the –48 Volt PDP uses 15-amp circuit breakers, and the 7133 contains at least one 18.2 GB, 10020 rpm disk drive module, the 7133 must contain no more than nine disk drive modules. Otherwise, no limitations exist for other types of disk drive module.  
If the –48 Volt PDP uses 20-amp circuit breakers, no limitations exist for any types of disk drive module.
- Both power supply assemblies in a 7133 must be of the same voltage rating. **Do not mix power supply assemblies of different voltage ratings.**

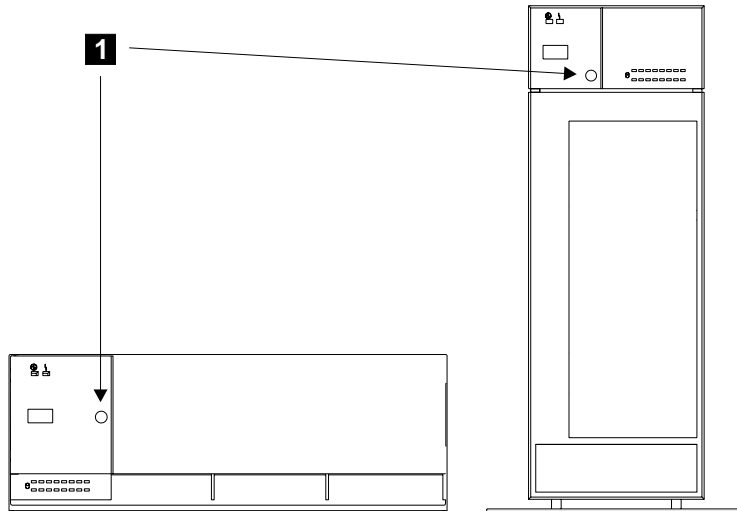
---

## 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). The flap pivots to the left.



*Figure 2. Operator Panel Flap and Latch Button*

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

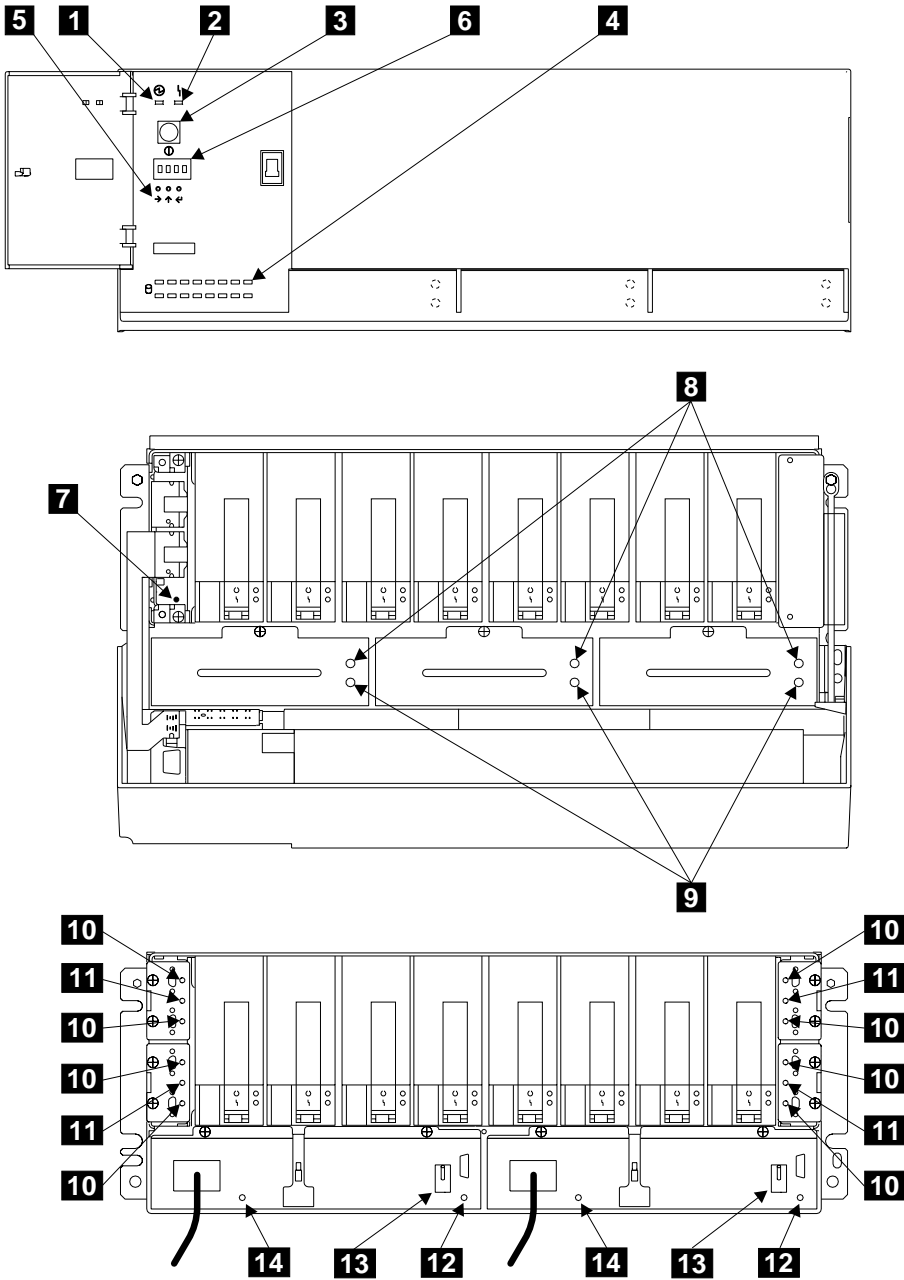


Figure 3. Lights and Controls of Model D40



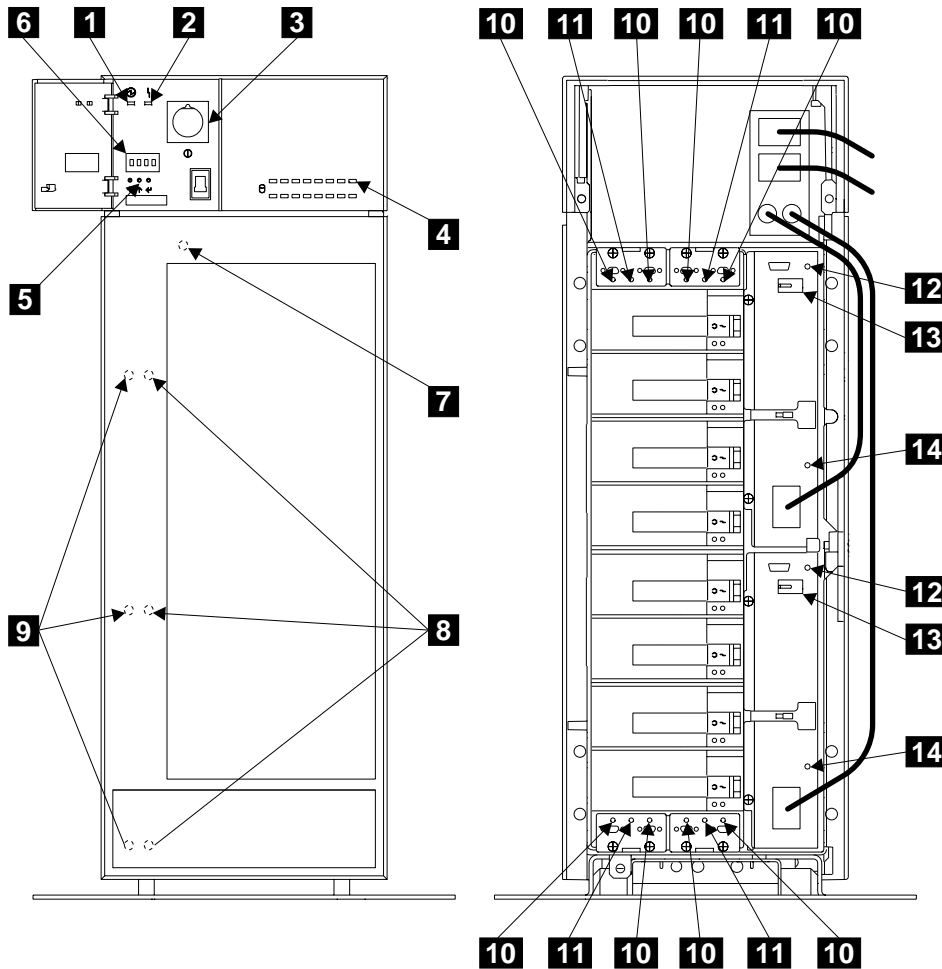


Figure 4. Lights and Controls of Model T40

## Operator Panel Lights and Controls

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

### Power switch **3** :

- 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 1**: 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 2**: 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 6**: 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	80241
BP16	80242
BP4	80243
BP5	80244
BP8	80245
BP9	80246
BP12	80247
BP13	80248
CODE	80210
COLD	80253
COOL	80254
CTRL	80210
FAN1	80231
FAN2	80232
FAN3	80233
HOT	80251
OPNL	80211
POST-FAIL-XXXX	80210
Where XXXX= XROM WDOG IROM IRAM LED! I2C RTC1 RTC2 TIME UART FAN XRAM	
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 5**: These three push buttons set the Subsystem ID that is shown on the ID display **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: <ul style="list-style-type: none"><li>• 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.</li><li>• A dummy disk drive module is present in this position.</li><li>• The disk drive modules or module and SSA attachment that are logically next to this module are inactive.</li><li>• An SSA attachment that is in the loop is inactive.</li><li>• A power-on self-test (POST) is running on this disk drive module.</li></ul>
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 spinning. 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: <ul style="list-style-type: none"><li>• The path through this port is not operational.</li><li>• The card is switched into Bypass state (mode light shows amber).</li><li>• The card is jumpered for Forced Inline mode (mode light shows green).</li></ul>
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

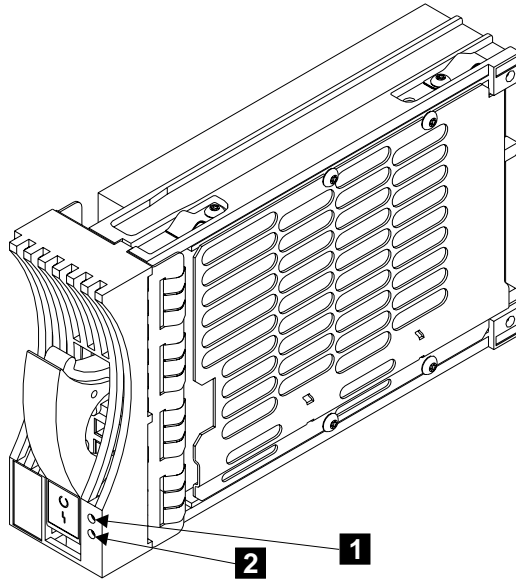


Figure 5. Disk Drive Module Lights

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

<b>Status of Light</b>	<b>Meaning</b>
Off	<p>Both SSA links are inactive because one of the following conditions exists:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• The disk drive modules or module and SSA attachment that are logically next to this module are inactive.</li> <li>• An SSA attachment that is in the loop is inactive.</li> <li>• A power-on self-test (POST) is running on this disk drive module.</li> </ul>
Permanently on	<p>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 spinning. The module might be waiting for a Motor Start command, or might have received a Motor Stop Command.</p>
Slow flash (two seconds on, two seconds off)	<p>Only one SSA link is active.</p>
Fast flash (five times per second)	<p>The disk drive module is active with a command in progress.</p>

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: <ul style="list-style-type: none"><li>• An unrecoverable error that prevents the normal operation of the SSA link has been detected.</li><li>• 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.</li><li>• Neither SSA link is active.</li><li>• The disk drive module is in Service mode, and can be removed from the 7133.</li></ul>
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.

- |          |                                   |           |                                    |
|----------|-----------------------------------|-----------|------------------------------------|
| <b>1</b> | Front cover                       | <b>8</b>  | Power supply assembly (position 2) |
| <b>2</b> | Operator panel assembly           | <b>9</b>  | Power supply assembly (position 1) |
| <b>3</b> | Disk drive status lights assembly | <b>10</b> | Bypass card 1 (ports 4 and 5)      |
| <b>4</b> | Controller card assembly          | <b>11</b> | Bypass card 2 (ports 8 and 9)      |
| <b>5</b> | Disk drive modules                | <b>12</b> | Fan assembly (position 3)          |
| <b>6</b> | Bypass card 3 (ports 1 and 16)    | <b>13</b> | Fan assembly (position 2)          |
| <b>7</b> | Bypass card 4 (ports 12 and 13)   | <b>14</b> | Fan assembly (position 1)          |

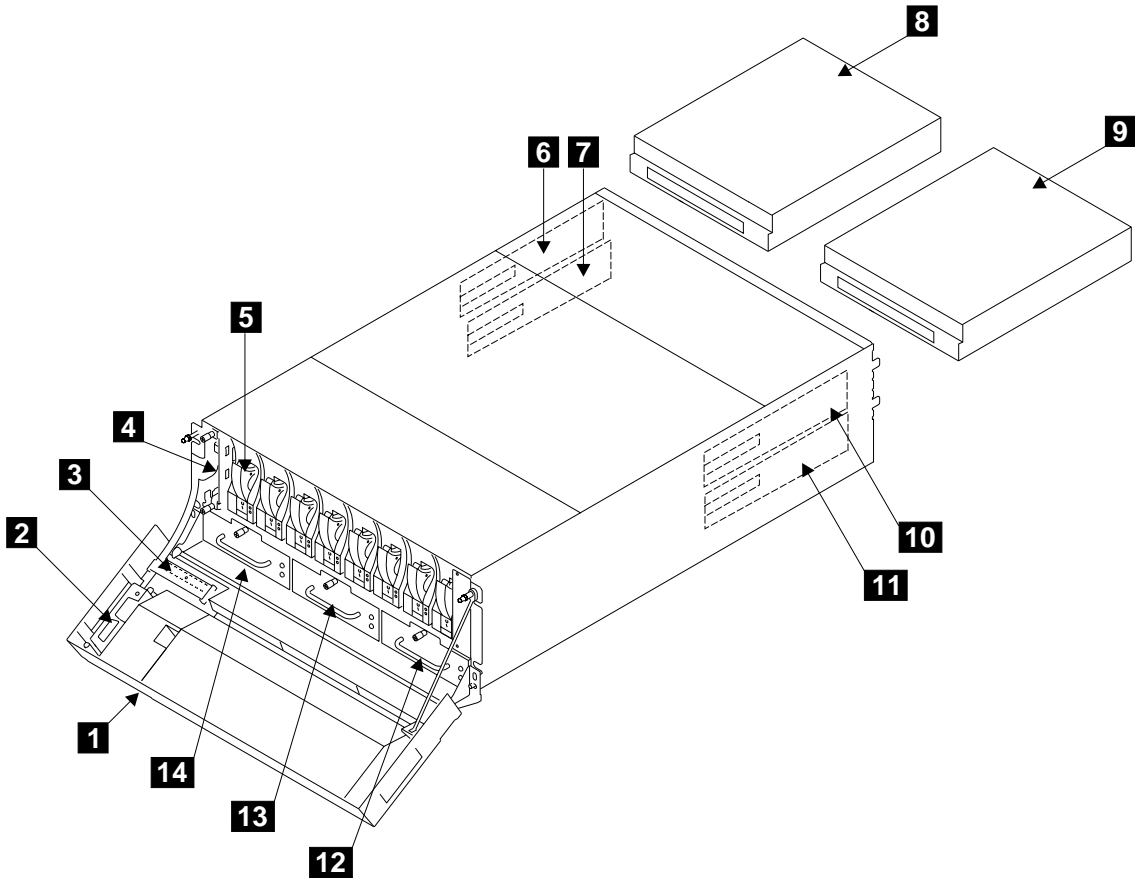


Figure 6. Parts Locations of Model D40

**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.

- |          |                                    |           |                                    |
|----------|------------------------------------|-----------|------------------------------------|
| <b>1</b> | Front cover                        | <b>9</b>  | Power supply assembly (position 1) |
| <b>2</b> | Operator panel assembly            | <b>10</b> | Back cover                         |
| <b>3</b> | Disk drive status lights assembly  | <b>11</b> | Bypass card 1 (ports 4 and 5)      |
| <b>4</b> | Controller card assembly           | <b>12</b> | Bypass card 2 (ports 8 and 9)      |
| <b>5</b> | Power switch and cable assembly    | <b>13</b> | Disk drive modules                 |
| <b>6</b> | Bypass card 4 (ports 12 and 13)    | <b>14</b> | Fan assembly (position 3)          |
| <b>7</b> | Bypass card 3 (ports 1 and 16)     | <b>15</b> | Fan assembly (position 2)          |
| <b>8</b> | Power supply assembly (position 2) | <b>16</b> | Fan assembly (position 1)          |

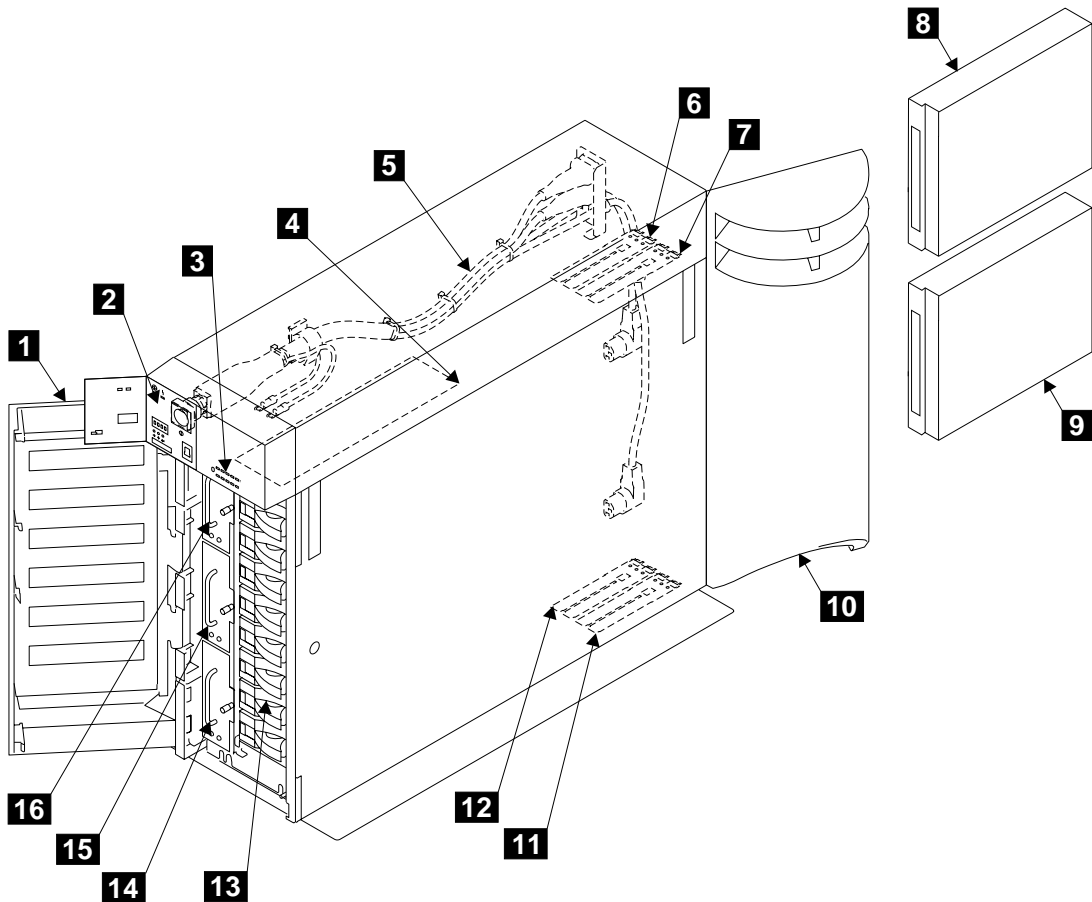


Figure 7. Parts Locations of Model T40

**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

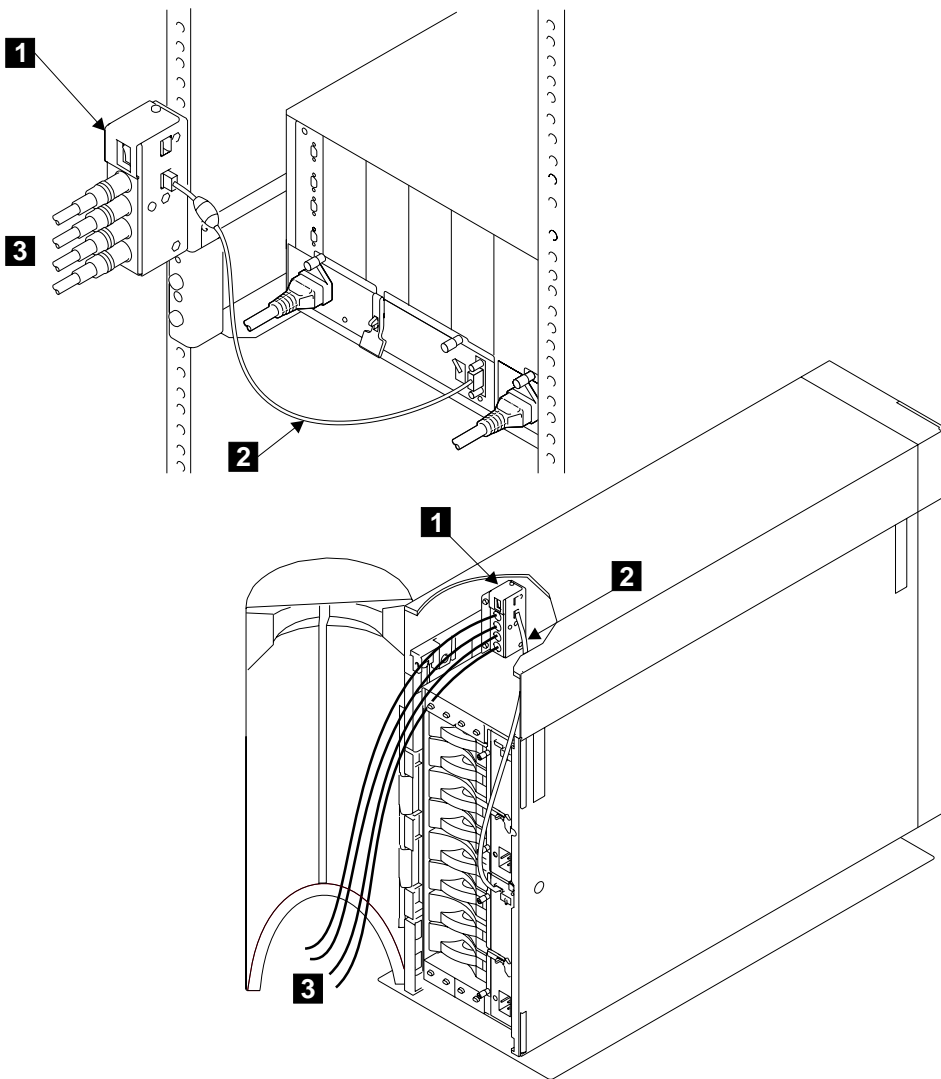


Figure 8. Remote-Power-On Control Unit and Cables



## 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

- |          |                                      |          |                                 |
|----------|--------------------------------------|----------|---------------------------------|
| <b>1</b> | Advanced SSA Optical Extender (Pair) | <b>6</b> | Fibre optic cable               |
| <b>2</b> | Power light                          | <b>7</b> | Wrap cable and adapter assembly |
| <b>3</b> | Receive light                        | <b>8</b> | Fibre optic wrap cable          |
| <b>4</b> | Receive symbol                       | <b>9</b> | Fibre optic wrap adapter        |
| <b>5</b> | Transmit symbol                      |          |                                 |

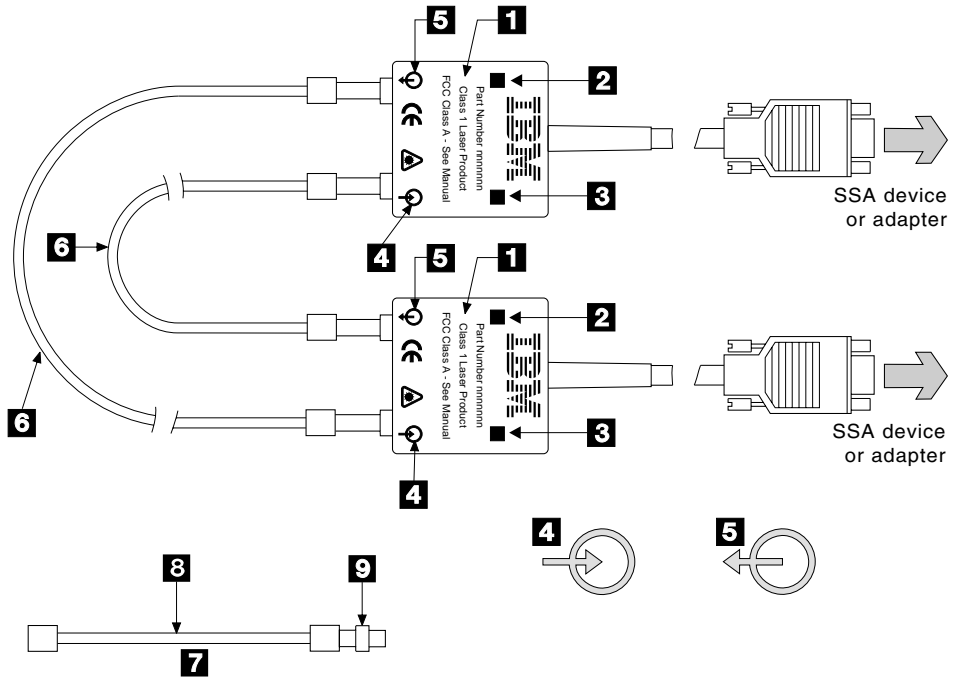


Figure 9. Advanced SSA Optical Extenders and Fibre Optic Cables in Single-Mode Configuration

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

- |   |   |
|---|---|
| <b>1</b> Advanced SSA Optical Extender (Pair) | <b>8</b> Advanced Multi-Mode Conditioner (Pair) |
| <b>2</b> Receive light                        | <b>9</b> Uniter                                 |
| <b>3</b> Receive symbol                       | <b>10</b> Multi-mode fibre optic cable          |
| <b>4</b> Transmit symbol                      | <b>11</b> Wrap cable and adapter assembly       |
| <b>5</b> Power light                          | <b>12</b> Fibre optic wrap cable                |
| <b>6</b> Yellow fibre                         | <b>13</b> Fibre optic wrap adapter              |
| <b>7</b> Orange fibre                         |   |

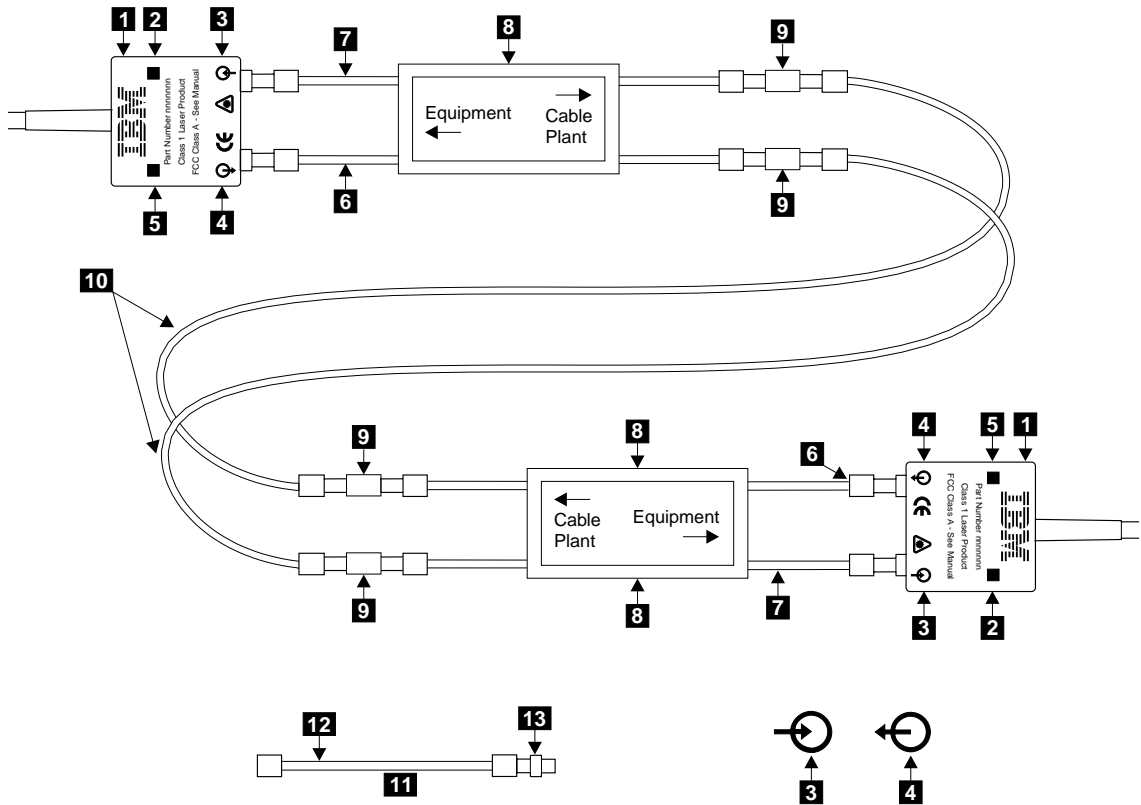


Figure 10. Advanced SSA Optical Extenders and Fibre Optic Cables in Multi-Mode Configuration

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 uniter **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 27).

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 <b>Note:</b> 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. <b>Note:</b> Lengths of 3 kilometers and 10 kilometers are permitted only if the fibre optic connection is between: <ul style="list-style-type: none"><li>• Two 7133s Model D40 or T40</li><li>• A 7133 Model D40 and a 7133 Model T40</li><li>• A 7133 Model D40 or T40 and an Advanced SerialRAID Adapter</li><li>• A 7133 Model D40 or T40 and an Advanced SerialRAID/X Adapter</li><li>• Two Advanced SerialRAID Adapters</li><li>• Two Advanced SerialRAID/X Adapters</li></ul>

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

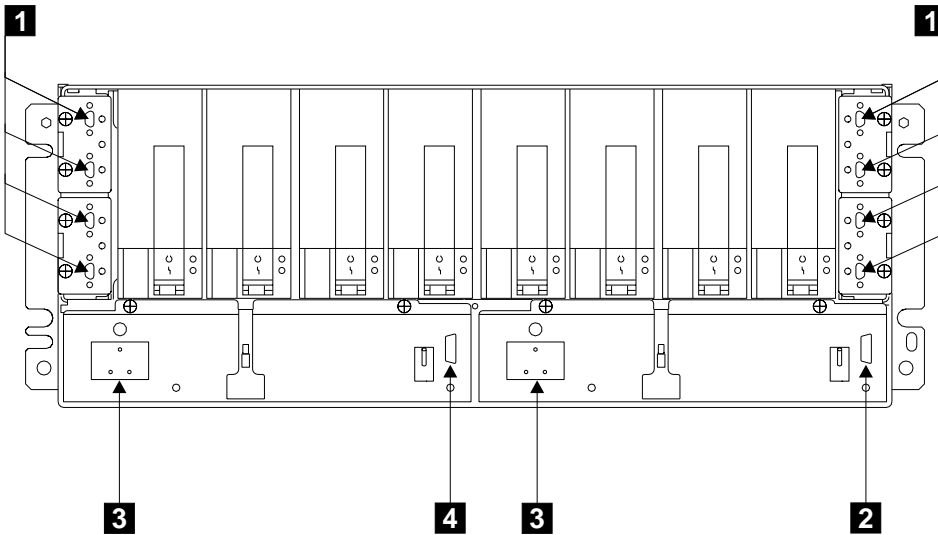


Figure 11. Back Connectors of Model D40

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 28 summarizes the relationship between the disk drive module strings and the external SSA connectors.

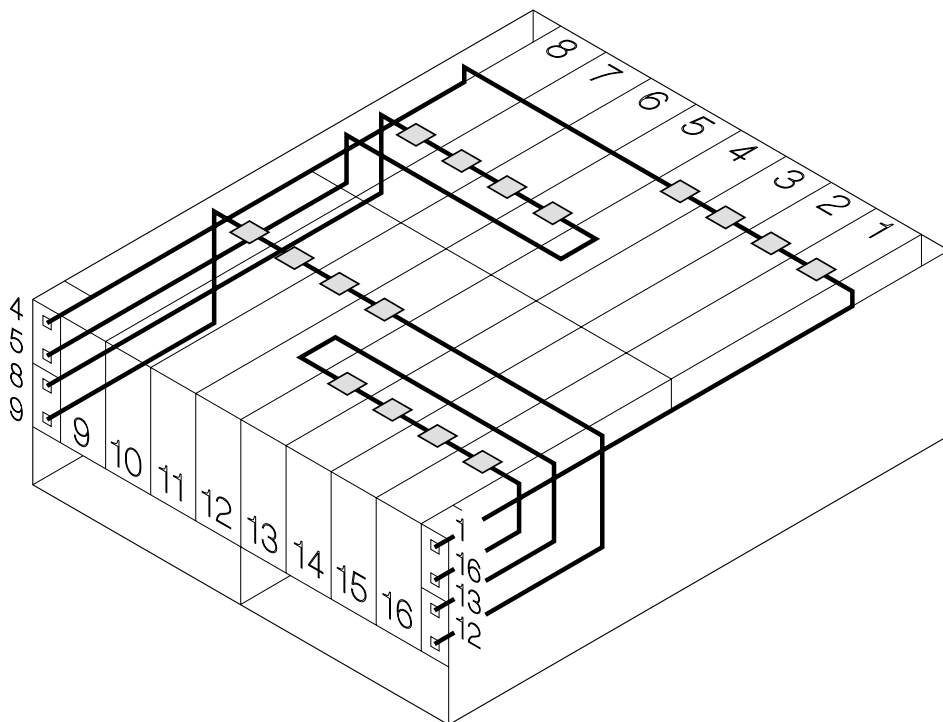


Figure 12. Internal Connections of Model D40

## Back Connectors (Model T40)

- 1** Mainline power connectors
- 2** Reserved
- 3** Power control connector
- 4** SSA connectors

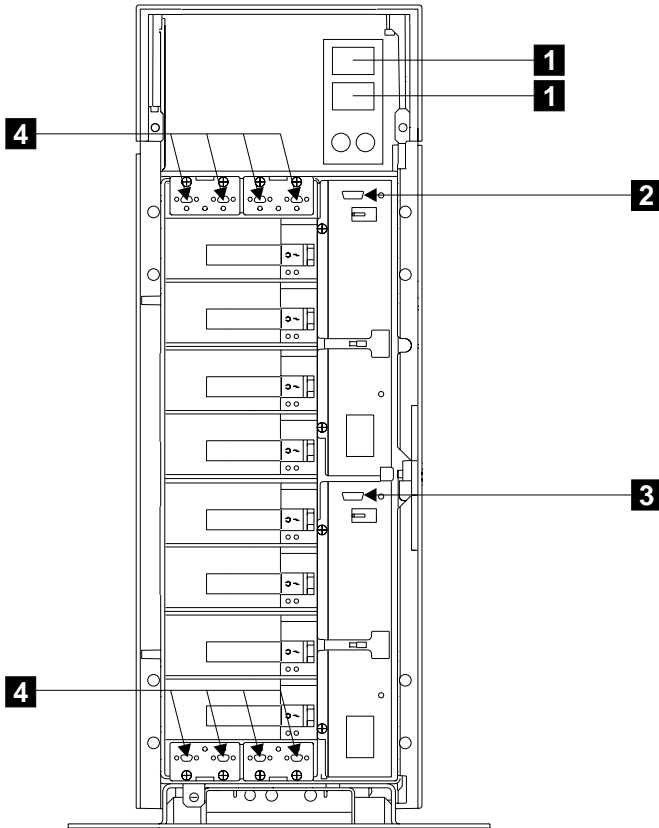


Figure 13. Back Connectors of Model T40

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 30 summarizes the relationship between the disk drive module strings and the external SSA connectors.

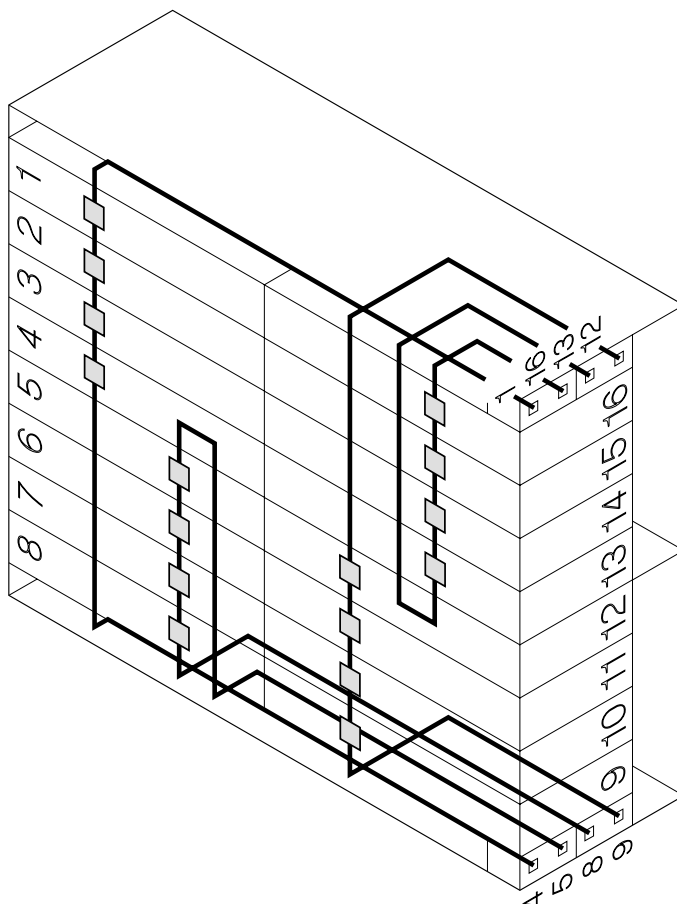


Figure 14. Internal Connections of Model T40

## SSA Connectors

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

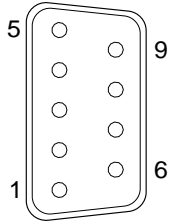


Figure 15. SSA Connectors

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.

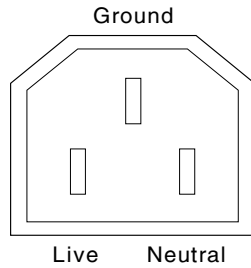


Figure 16. Mainline-Power Connector (220 V ac/dc, Model D40)

**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.

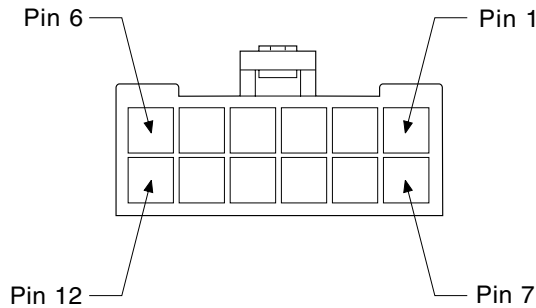


Figure 17. Mainline-Power Connector (-48 V dc)

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 of connector is used in the power switch and cable assembly. It permits the 7133 to be connected to a mainline power source.

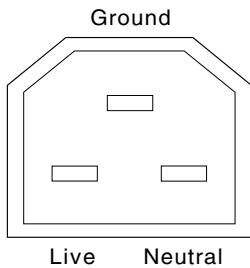


Figure 18. Mainline-Power Connector (220 V ac, Model T40)

## Internal Power Connector (Model T40)

This type of connector is on each power supply assembly.

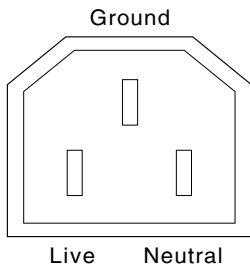


Figure 19. Internal Power Connector (220V ac, Model T40)

## 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

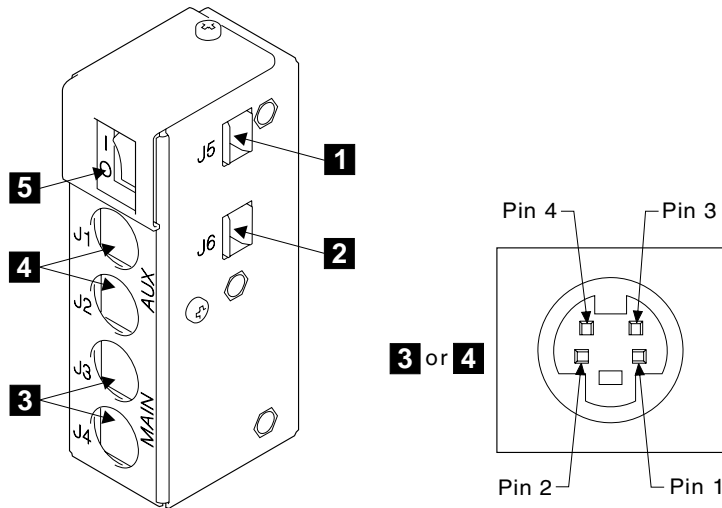


Figure 20. Remote-Power-On Control Unit Connectors and Switch

### 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

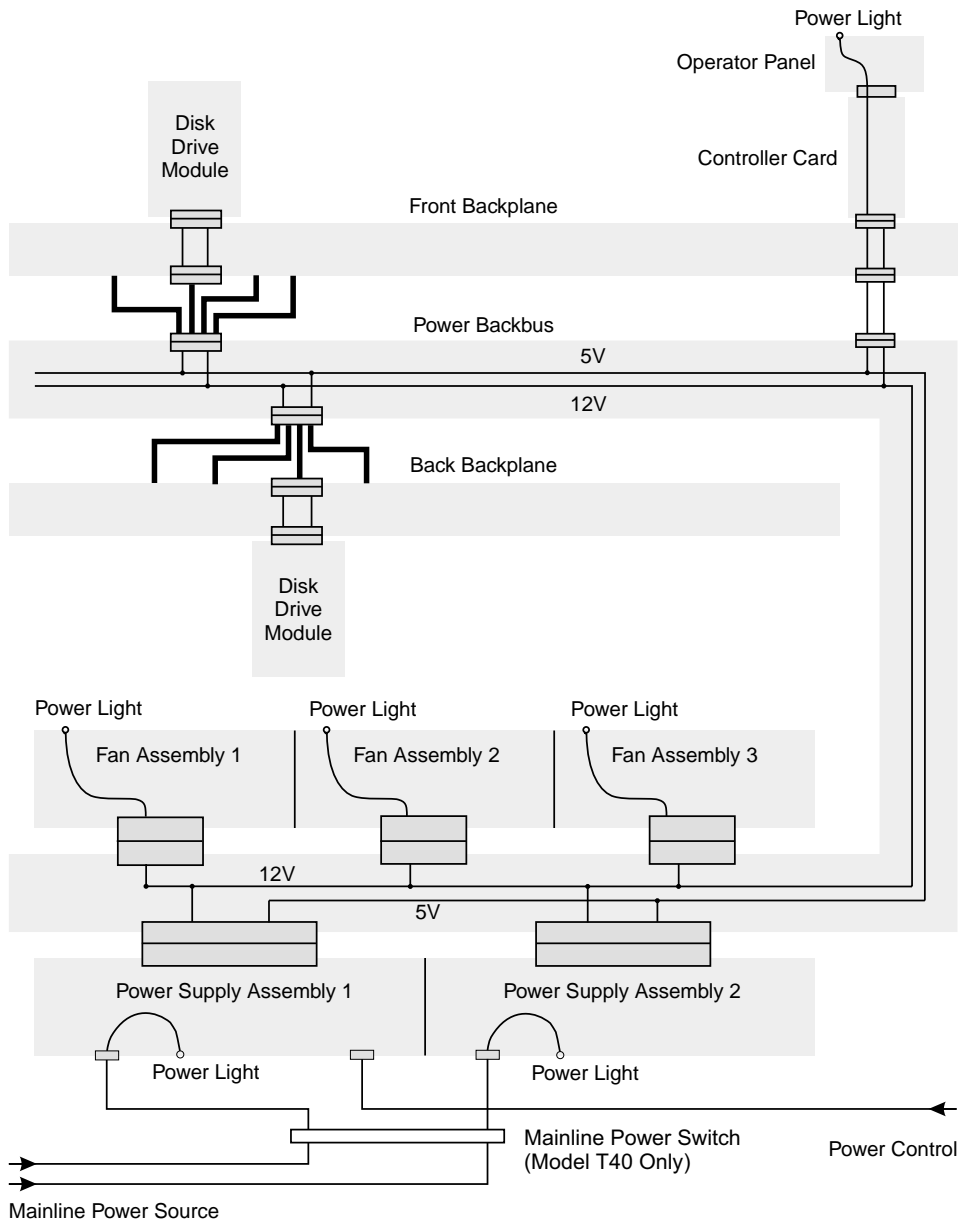


Figure 21. Power Distribution

## Labels

- |          |                                |          |                                   |
|----------|--------------------------------|----------|-----------------------------------|
| <b>1</b> | Serial number (7133 Model D40) | <b>4</b> | Serial number (disk drive module) |
| <b>2</b> | Serial number (7133 Model T40) | <b>5</b> | Last 8 digits of the SSA UID      |
| <b>3</b> | SSA 16-digit unique ID (UID)   |          |                                   |

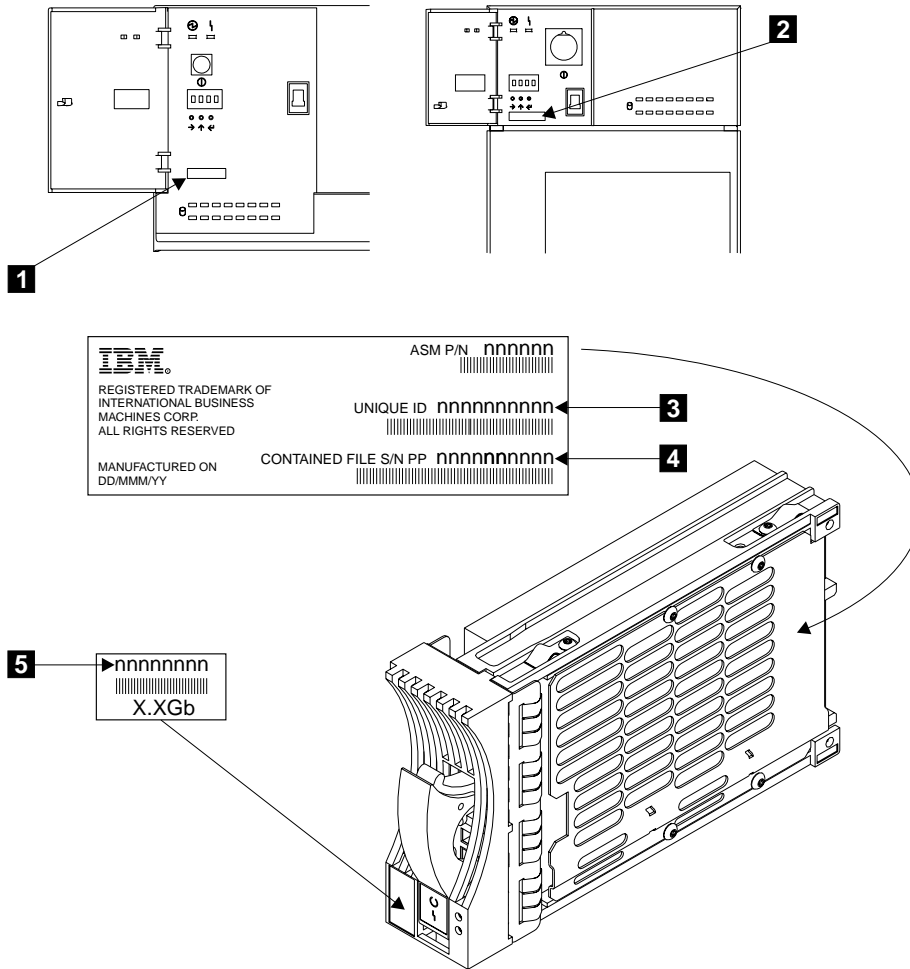


Figure 22. Serial-Number and SSA UID Labels

**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	53.5 kg
(6.7 in.)	(17.5 in.)	(29 in.)	(83 lb)	(118 lb)

### Dimensions and Weight (Model T40)

Height	Width	Depth	Approximate Minimum Weight	Approximate Maximum Weight
610 mm	210 mm	861 mm	61.2 kg	76.2 kg
(24 in.)	(8.3 in.)	(33.9 in.)	(135 lb)	(168 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)

#### Notes:

- Each rack-mounted 7133 Model D40 requires an airflow of 2.5 m<sup>3</sup> per minute (87 ft<sup>3</sup> per minute). When racks containing many 7133s are to be installed together, the following requirements must be met to ensure that the 7133s are adequately cooled:
  - The airflow 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 should be positioned in alternate rows, back-to-back and front-to-front.

- The front of racks should be positioned on floor-tile seams, with a full line of perforated tiles immediately in front of the racks. Each perforated tile should have an air flow of at least 11.34 m<sup>3</sup>/min (400 CFM). The underfloor temperature must not exceed 15°C (60°F).
  - Where racks are in rows front-to-front or back-to-back, there should be a gap of at least 1220 mm (48 in) separating the rows.
  - To ensure correct air flow within 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.
2. 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.

## Altitude

	<b>Operating Environment</b>	<b>Nonoperating Environment</b>	<b>Storing Environment</b>	<b>Shipping Environment</b>
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.

<b>Disk Drive Module Type</b>	<b>Speed (RPM)</b>	<b>Actual Formatted Size</b>	<b>512-Byte Blocks</b>
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	10020	9 111 591 424 bytes	17 796 077
18.2 GB	7200	18 223 183 872 bytes	35 592 156
18.2 GB	10020	18 223 183 872 bytes	35 592 156
36.4 GB	7200	36 446 367 744 bytes	71 184 312

## 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 264). 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:

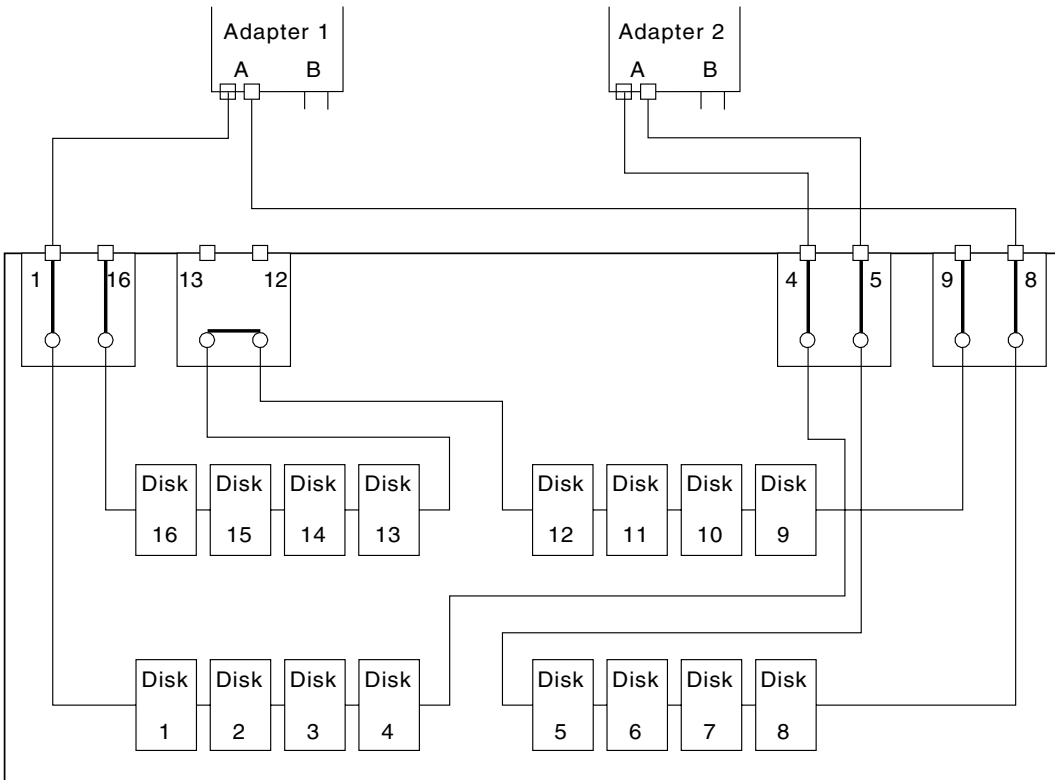


Figure 23. Automatic Mode: Power at Both SSA Adapters

If power is switched off to adapter 2, the loop is broken. The 7133 bypass card detects the loss of voltage, goes into bypass mode, and reconnects the loop. Adapter 2 is bypassed as shown in Figure 24.

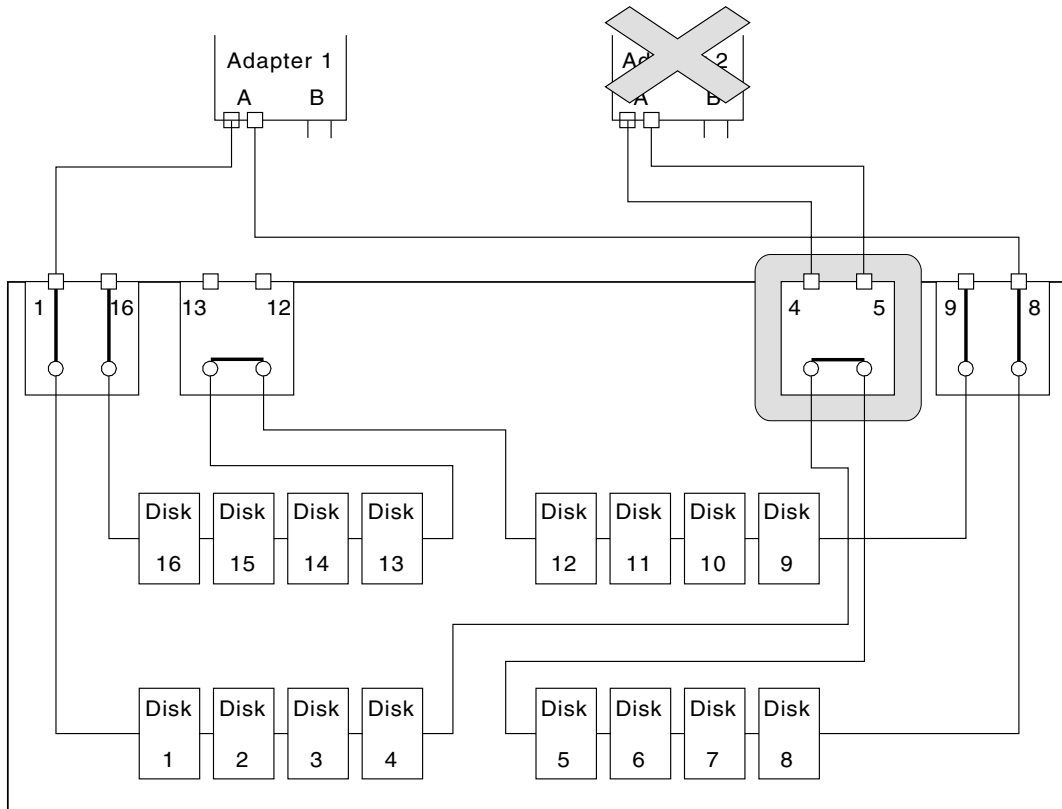


Figure 24. Automatic Mode: No Power at Adapter 2

## 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 Bypass 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.

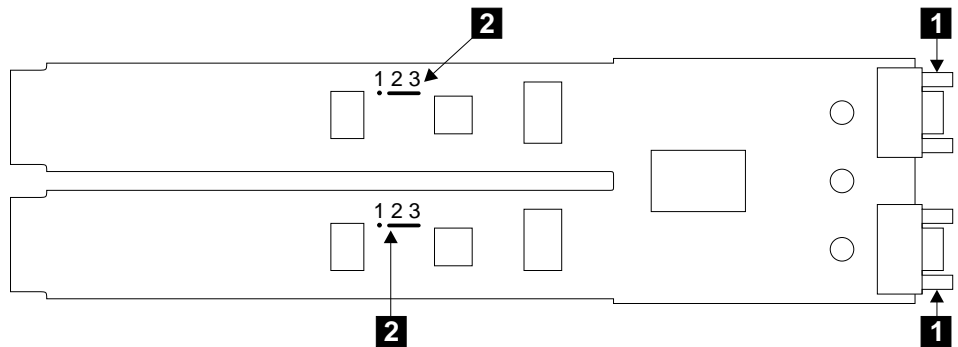
## Bypass Card Jumpers

**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 209.

### 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

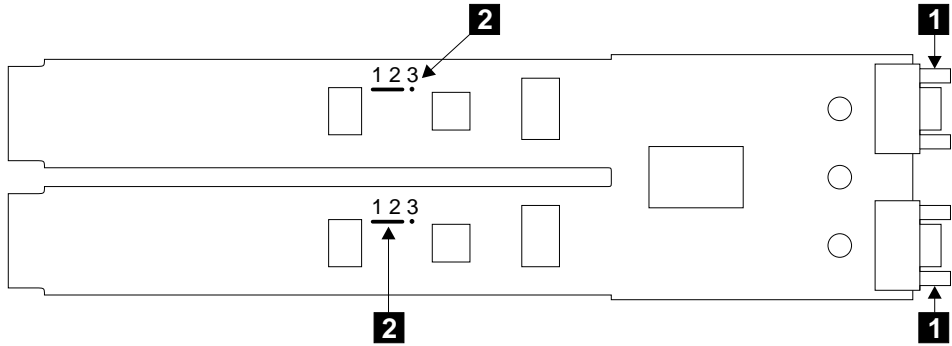


Figure 26. Bypass Card Jumpers Set for Forced Inline Mode



---

## 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 27 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 29 and “Internal Connections (Model T40)” on page 31.

## 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).

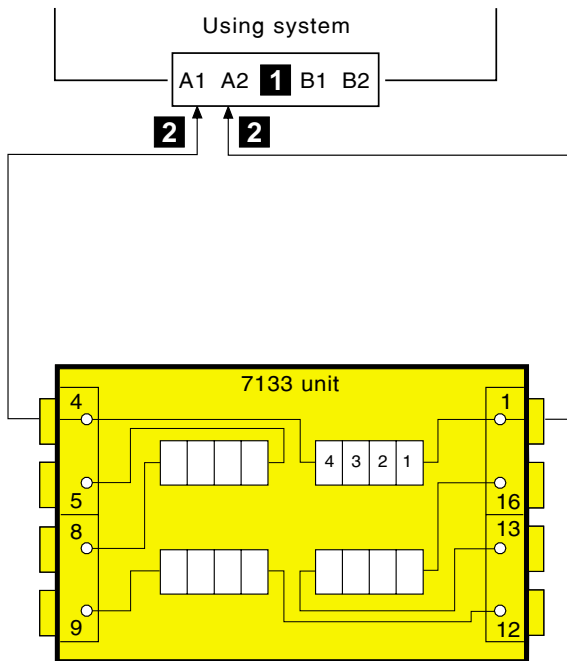


Figure 27. Simplest Configuration

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 55. The internal connections of the 7133 are shown in "Internal Connections (Model D40)" on page 29 and "Internal Connections (Model T40)" on page 31.

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).

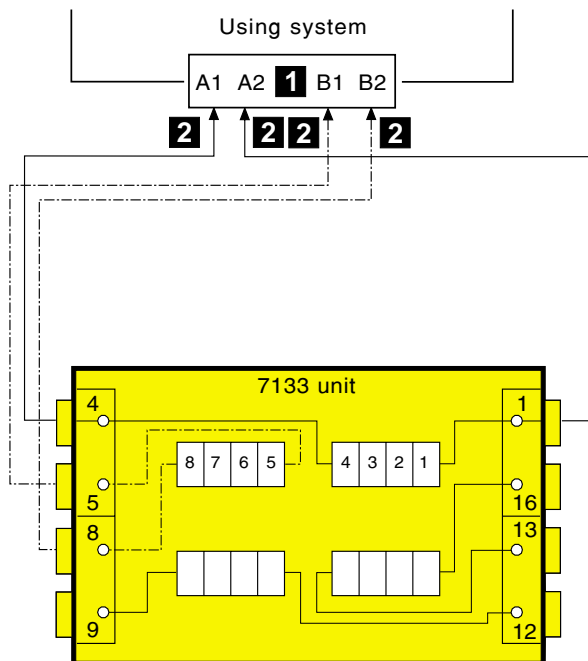


Figure 28. Larger Configuration

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 55. The internal connections of the 7133 are shown in "Internal Connections (Model D40)" on page 29 and "Internal Connections (Model T40)" on page 31.

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).

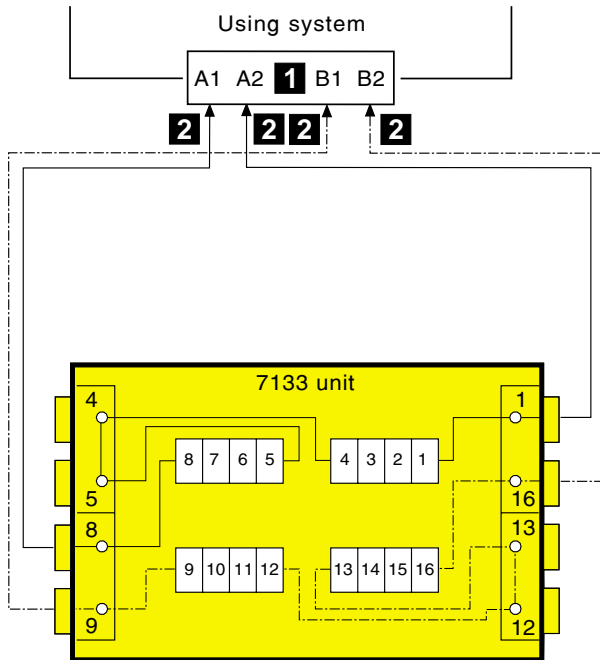


Figure 29. Largest Configuration with One 7133

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 55. The internal connections of the 7133 are shown in "Internal Connections (Model D40)" on page 29 and "Internal Connections (Model T40)" on page 31.

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).

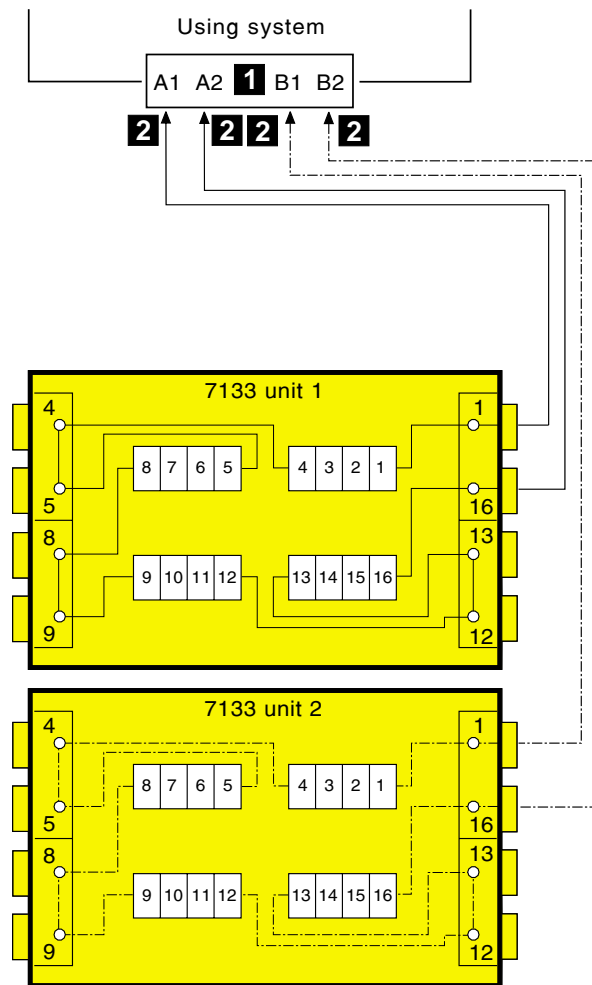


Figure 30. Multiple-Unit Configuration (Two 7133s)

The cables are described in “SSA Cables for 7133 Models D40 and T40” on page 55. The internal connections of the 7133 shown in “Internal Connections (Model D40)” on page 29 and “Internal Connections (Model T40)” on page 31.

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.

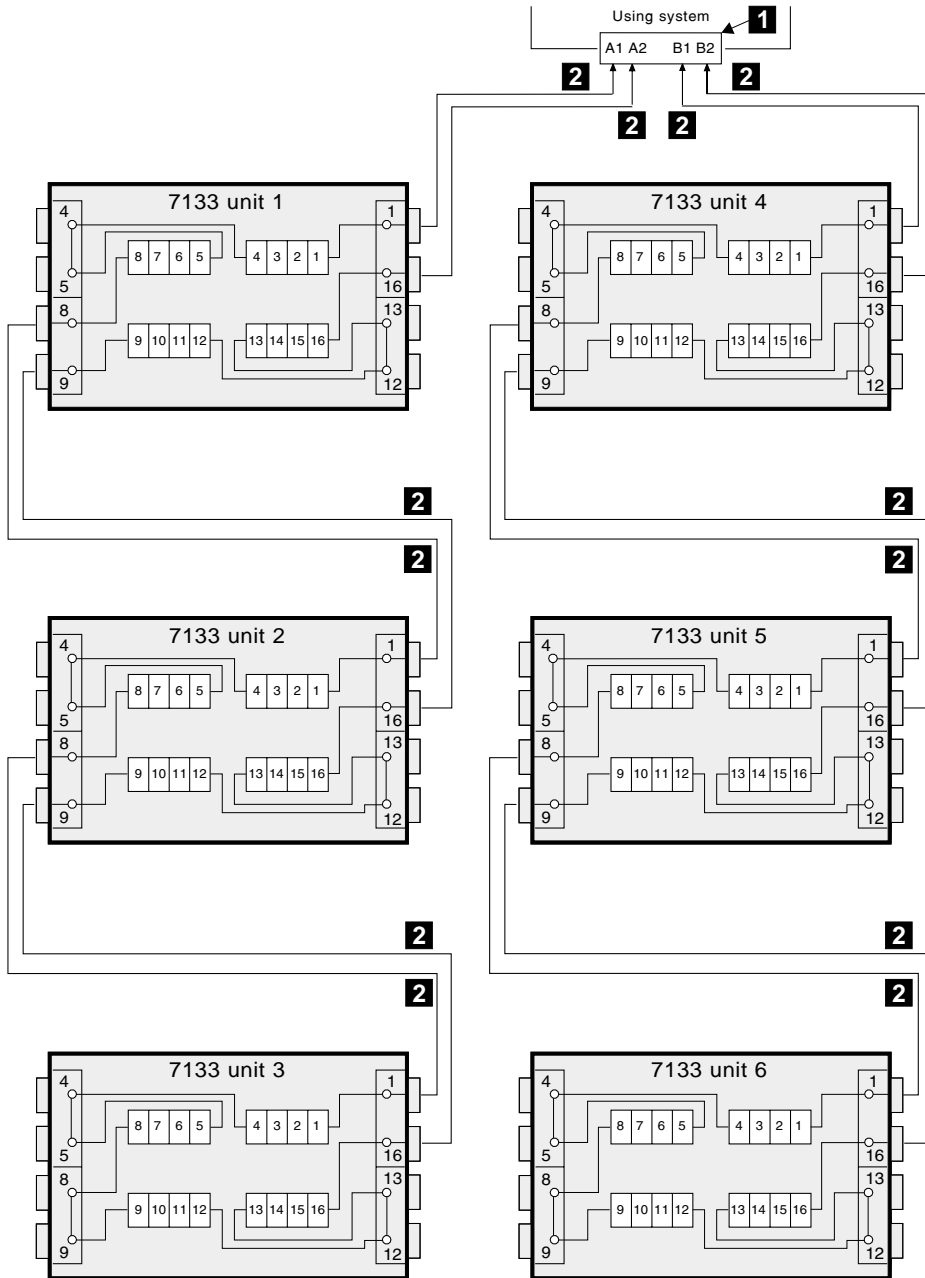


Figure 31. Multiple-Unit Configuration (Six 7133s)

## 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.

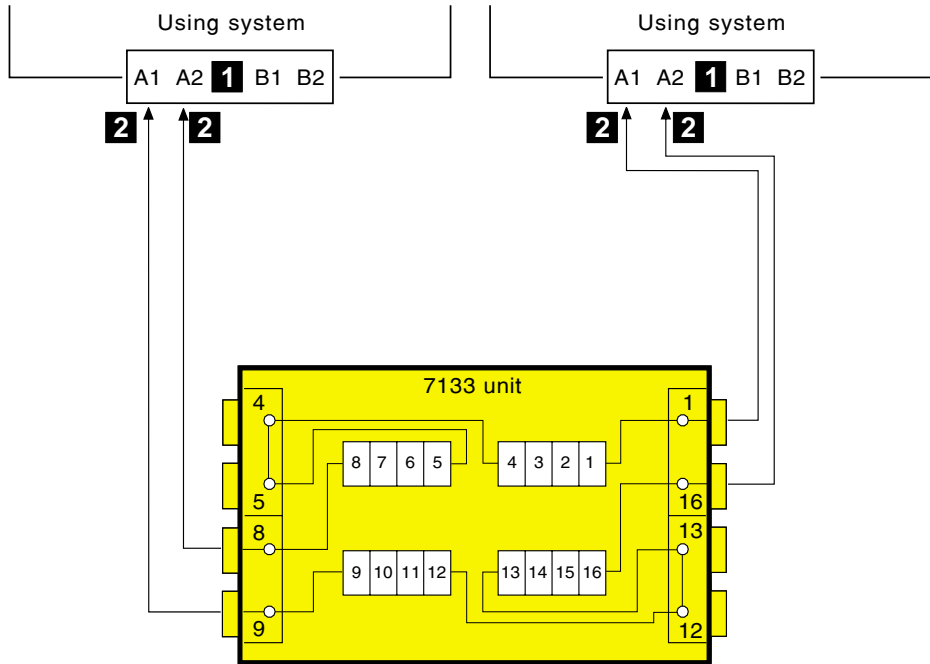


Figure 32. Higher-Availability Configuration (One 7133)

The cables are described in “SSA Cables for 7133 Models D40 and T40” on page 55. The internal connections of the 7133 are shown in “Internal Connections (Model D40)” on page 29 and “Internal Connections (Model T40)” on page 31.

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.



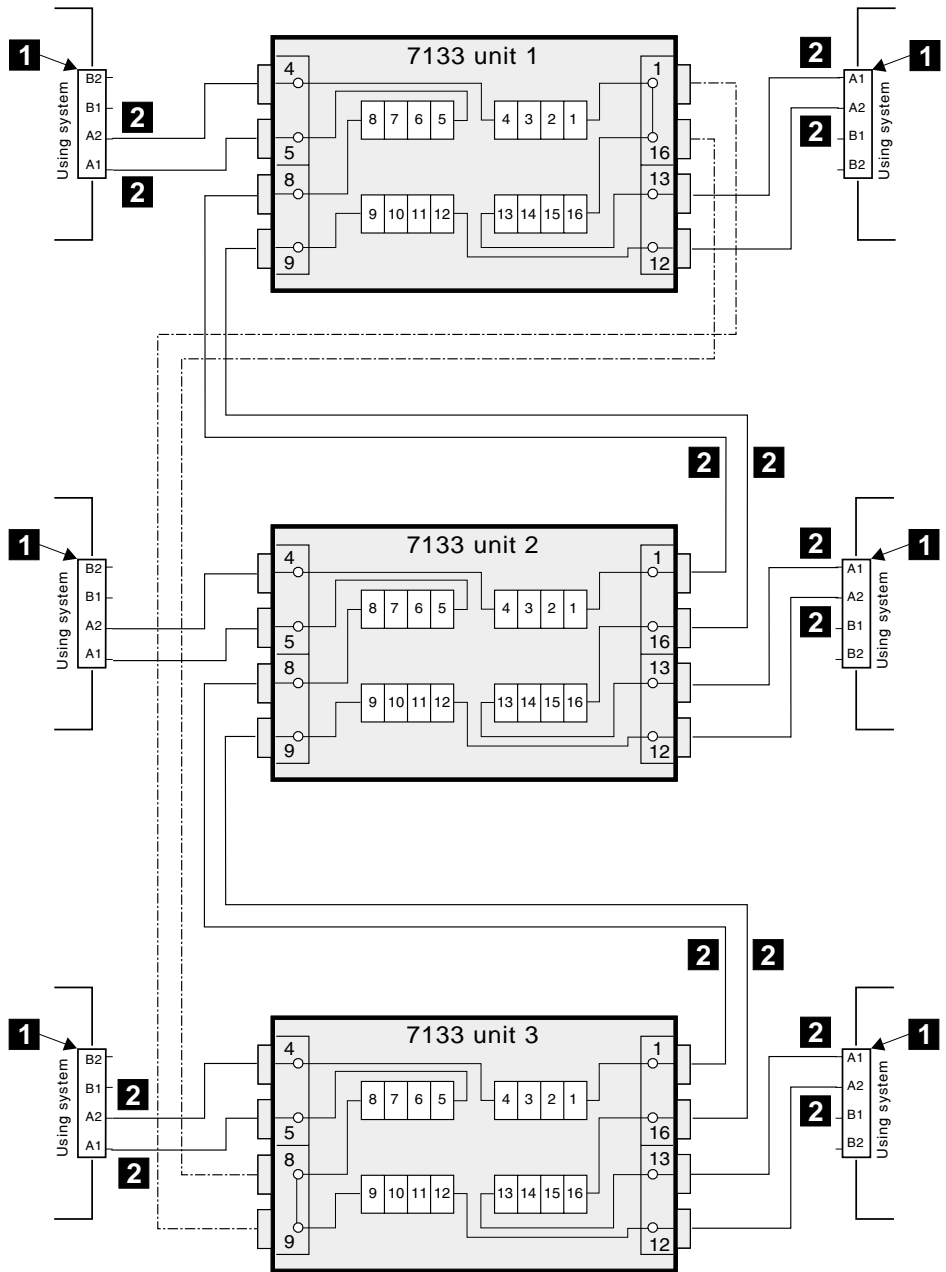


Figure 33. Higher-Availability Configuration (Three 7133s)

### SSA Cables for 7133 Models D40 and T40

Table 5 on page 56 shows the part numbers of the cables that are shown in the sample configurations.

Table 5. SSA Cables

Item	Part	Description
<b>1</b>	–	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.
<b>2</b>	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)  <b>Attention:</b> 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.

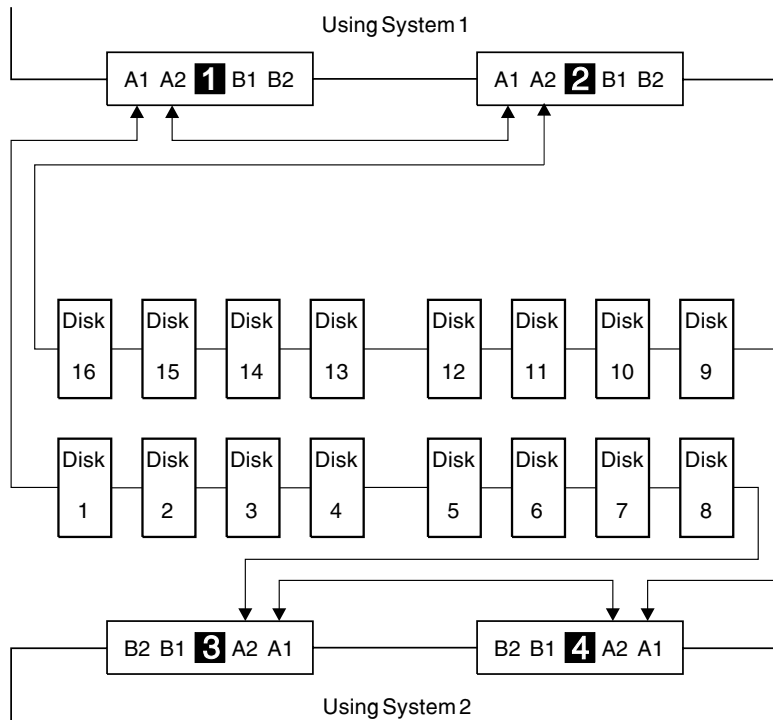


Figure 34. One Loop, Two SSA Attachments in Each of Two Using Systems

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.

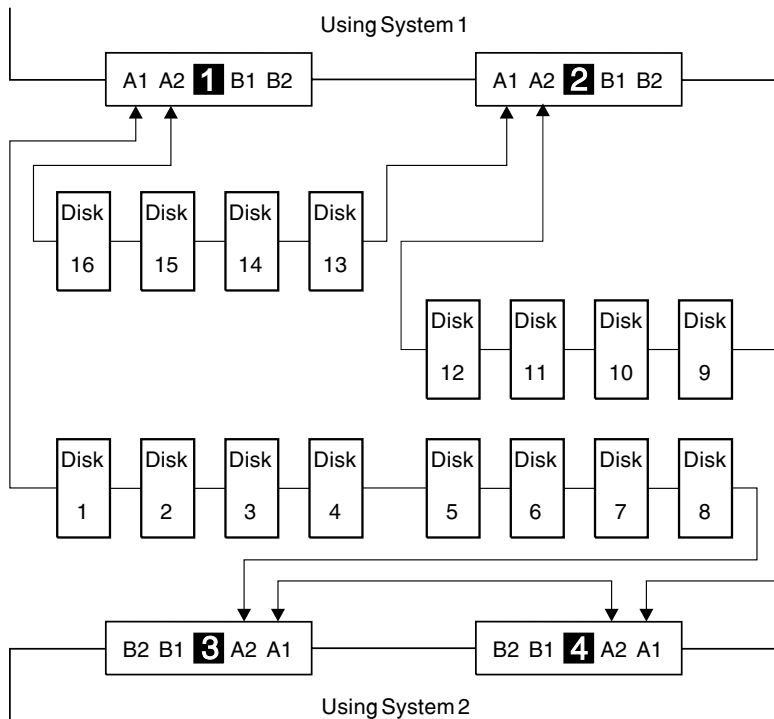


Figure 35. Disk Drive Modules Isolated by Failing Using System

---

## 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:

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

## SSA Disk Drives

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

## 7133 Models D40 and T40

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

<b>Part Number</b>	FRU part number
<b>Assembly Number</b>	Card level assembly part number
<b>Serial Number</b>	Card assembly serial number
<b>EC Number</b>	Card assembly engineering change level
<b>Product ID</b>	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).
- Reset the Exchanged and Swap flags for the FRU.

**Note:** The Exchange 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 146).
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.

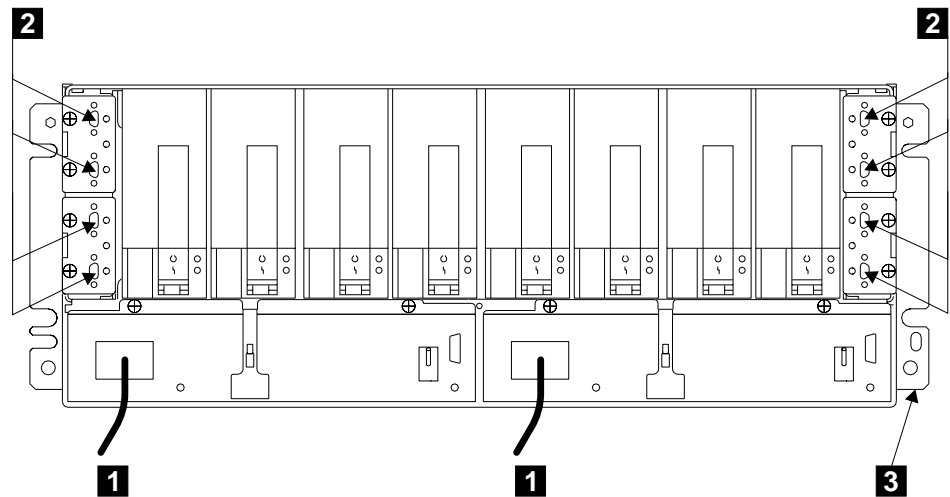


Figure 36. Power Cables and SSA Sockets (Model D40)

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.

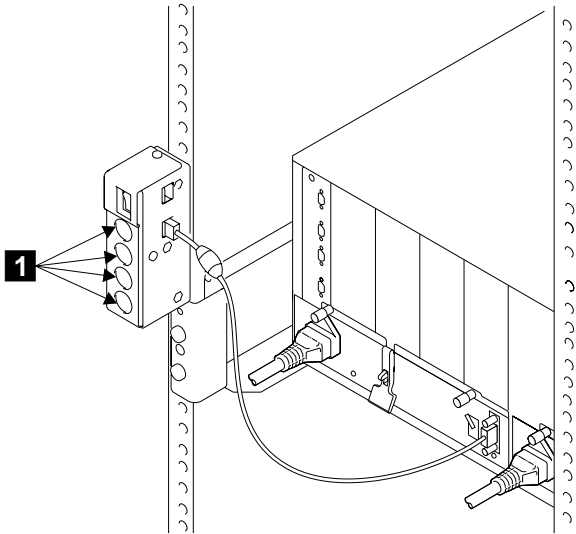


Figure 37. Remote-Power-On Control Unit

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.

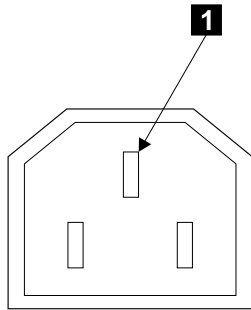


Figure 38. Ground Pin (Model D40: 220 V)

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.

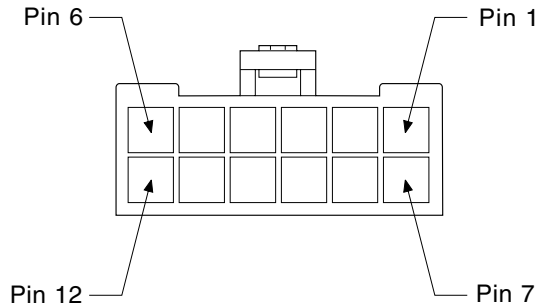


Figure 39. Ground Pins (Model D40: -48 V)

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 178), 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.

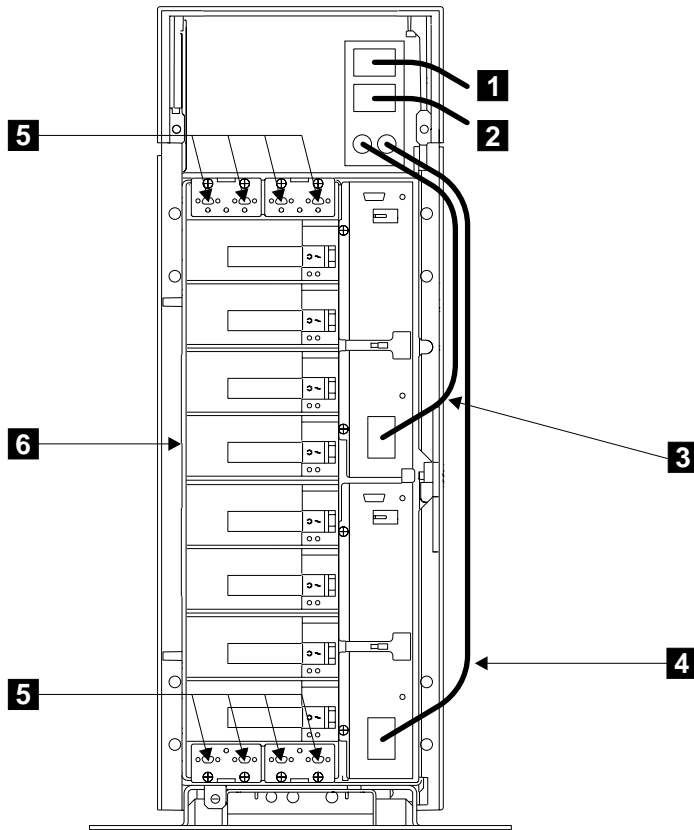


Figure 40. Power Cables and SSA Sockets (Model T40)

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.

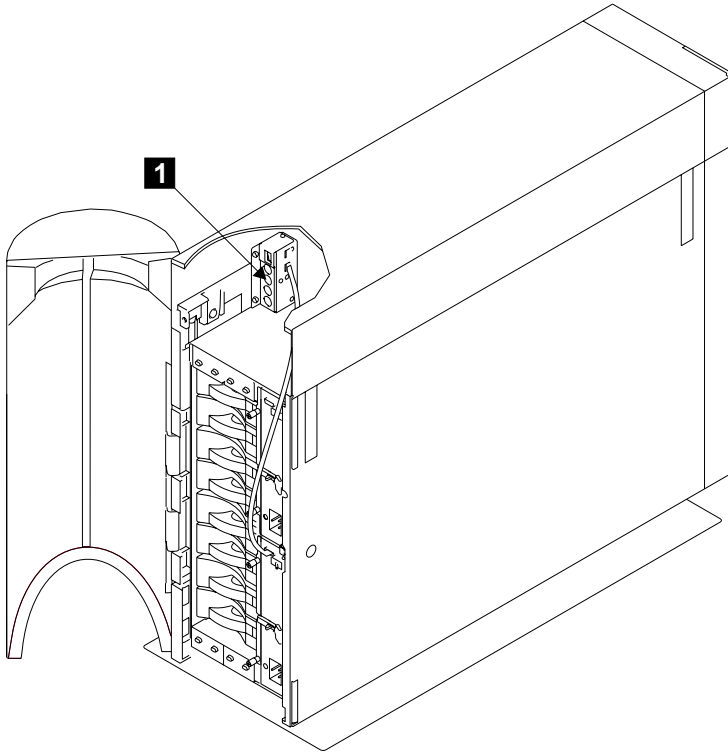


Figure 41. Remote-Power-On Control Unit

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.

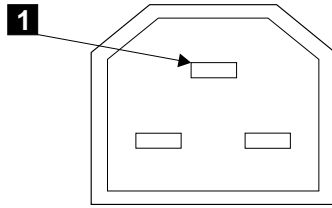


Figure 42. Ground Pin (Model T40)

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 34).
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 178), 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 205), 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:

<b>SRN</b>	The service reference number.
<b>FRU list</b>	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.
<b>Problem</b>	A description of the problem and the action you must take.

Abbreviations used in the table are:

<b>FRU</b>	Field-replaceable unit
<b>PAA</b>	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 132 to verify the repair.

## FRU Names Used in the SRN Table

This section provides a glossary of the FRU names used.

<b>FRU Name in Table</b>	<b>Definition</b>
<b>Frame assembly</b>	<i>The frame of the 7133 and the backplanes and cables that it contains.</i>
<b>Disk drive module</b>	<i>A disk drive attached to a carrier that plugs into one of the backplanes of the 7133.</i>
<b>External SSA cable</b>	<i>A cable that connects the 7133 to an SSA attachment or to another device (for example, another 7133).</i>
<b>Power supply assembly</b>	<i>An assembly that provides dc power to the 7133. The 7133 has two power supply assemblies.</i>
<b>Fan assembly</b>	<i>An assembly that contains a dc cooling fan. The 7133 has three fan assemblies.</i>
<b>Bypass card</b>	<i>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.</i>
<b>Controller card</b>	<i>The card that monitors and controls the various functions of the 7133.</i>
<b>SSA attachment</b>	<i>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.</i>

## The SRNs

SRN	FRU List	Problem
10104	<b>None</b>	<p>Description: Format in progress.</p> <p>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.</p>
10112	<b>None</b>	<p>Description: Format degraded. A Format operation has been ended before it has completed.</p> <p>Action: Use the Format service aid to format the disk drive module.</p>
1022F	<b>Disk-drive module (100%)</b> (“Disk Drive Modules” on page 151).	<p>Description: Critical over-temperature has been detected.</p> <p>Action: A disk drive module has reported that the temperature is too high.</p> <ul style="list-style-type: none"> <li>• If the ambient temperature is too high, take actions to decrease it.</li> <li>• If the ambient temperature is within specification, exchange the FRU for a new FRU.</li> </ul>
1XXXX	<b>Disk-drive module (100%)</b> (“Disk Drive Modules” on page 151).	<p>Description: Disk drive module error.</p> <p>Action: Exchange the FRU for a new FRU (see “Physical Location of a Device” on page 59).</p> <p><b>Note:</b> In this SRN, an X represents a digit 0 through F.</p>
20PAA	<p><b>Disk-drive module (45%)</b> (“Disk Drive Modules” on page 151).</p> <p><b>SSA attachment (45%)</b> (using-system <i>Installation and Service Guide</i>).</p> <p><b>External SSA cables, optical extenders, or main fibre optic cables (6%)</b>.</p> <p><b>Frame assembly (2%)</b> (“Frame Assembly” on page 216).</p> <p><b>Bypass card (2%)</b> (“Bypass (SNBC) Cards” on page 209).</p>	<p>Description: An open SSA loop has been detected.</p> <p>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).</p> <p>If the SSA service aids are not available:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• When the failing device is not in a 7133 Model D40 or Model T40, go to the service information for that device.</li> </ul>

SRN	FRU List	Problem
21PAA to 29PAA	<p><b>Disk-drive module (45%)</b> (“Disk Drive Modules” on page 151).</p> <p><b>SSA attachment (45%)</b> (using-system <i>Installation and Service Guide</i>).</p> <p><b>External SSA cables, optical extenders, or main fibre optic cables (6%).</b></p> <p><b>Frame assembly (2%)</b> (“Frame Assembly” on page 216).</p> <p><b>Bypass card (2%)</b> (“Bypass (SNBC) Cards” on page 209).</p>	<p>Description: An SSA ‘Threshold exceeded’ link error has been detected.</p> <p>Action: Go to the Intermittent Link Error MAP in the user or maintenance information for your using-system SSA attachment.</p>
2A002	<p><b>Disk-drive module (50%)</b> (“Disk Drive Modules” on page 151).</p> <p><b>SSA attachment (50%)</b> (using-system <i>Installation and Service Guide</i>).</p>	<p>Description: Async code 02 has been received. Probably, a software error has occurred.</p> <p>Action: Go to Software and Microcode Errors in the “Additional Information” appendix (in this book) for your using system before exchanging any FRUs.</p>
2A003	<p><b>Disk-drive module (50%)</b> (“Disk Drive Modules” on page 151).</p> <p><b>SSA attachment (50%)</b> (using-system <i>Installation and Service Guide</i>).</p>	<p>Description: Async code 03 has been received. Probably, a software error has occurred.</p> <p>Action: Go to Software and Microcode Errors in the “Additional Information” appendix (in this book) for your using system before exchanging any FRUs.</p>
2A004	<p><b>Disk-drive module (50%)</b> (“Disk Drive Modules” on page 151).</p> <p><b>SSA attachment (50%)</b> (using-system <i>Installation and Service Guide</i>).</p>	<p>Description: Async code 04 has been received. Probably, a software error has occurred.</p> <p>Action: Go to Software and Microcode Errors in the “Additional Information” appendix (in this book) for your using system before exchanging any FRUs.</p>
2A005 2A006 2A106	<p><b>Power supply assembly (46%)</b> (“Power Supply Assemblies” on page 178).</p> <p><b>Fan assembly (46%)</b> (“Fan Assemblies” on page 188).</p> <p><b>Controller card asm (5%)</b> (“Controller Card Assembly” on page 207).</p> <p><b>Frame assembly (3%)</b> (“Frame Assembly” on page 216).</p>	<p>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.</p> <p>Action: Go to “MAP 2010: 7133 Models D40 and T40 – START” on page 87 to further isolate the problem.</p>



SRN	FRU List	Problem
2A206	<b>Disk drive module (100%)</b> (“Disk Drive Modules” on page 151).	<p>Description: A disk drive module has detected that one of its SSA links has failed the POSTs.</p> <p>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.</p>
2FFFF	<b>None</b>	<p>Description: An async code that is not valid has been received.</p> <p>Action: Go to Software and Microcode Errors in the “Additional Information” appendix (in this book) for your using system.</p>
300C0 301C0	<p><b>Power supply assembly (46%)</b> (“Power Supply Assemblies” on page 178).</p> <p><b>Fan assembly (46%)</b> (“Fan Assemblies” on page 188).</p> <p><b>Controller card asm (5%)</b> (“Controller Card Assembly” on page 207).</p> <p><b>Frame assembly (3%)</b> (“Frame Assembly” on page 216).</p>	<p>Description: A health check has reported that one or more disk drive modules have detected the loss of redundant power or cooling.</p> <p>Action: Go to “MAP 2010: 7133 Models D40 and T40 – START” on page 87 to further isolate the problem.</p>
303FE	<b>Disk drive module (100%)</b> (“Disk Drive Modules” on page 151).	<p>Description: A disk drive module has reported a microcode error.</p> <p>Action: Go to Software and Microcode Errors in the “Additional Information” appendix (in this book) for your using system before exchanging any FRUs.</p>
303FF	<b>Disk drive module (100%)</b> (“Disk Drive Modules” on page 151).	<p>Description: An SCSI status that is not valid has been received.</p> <p>Action: Go to Software and Microcode Errors in the “Additional Information” appendix (in this book) for your using system before exchanging any FRUs.</p>
31000	<b>Disk drive module (100%)</b> (“Disk Drive Modules” on page 151).	<p>Description: The disk drive has been reset by the attachment. The disk drive might be going to fail.</p> <p>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.</p>

SRN	FRU List	Problem
33PAA to 4252C	<b>Not applicable</b>	<p>Description: SRNs in this range are not enclosure (subsystem) SRNs.</p> <p>Action: For SRNs in this range, see the documentation for your SSA attachment.</p>
43PAA	<p><b>Disk drive module (90%)</b> (“Disk Drive Modules” on page 151).</p> <p><b>SSA attachment (10%)</b> (using-system <i>Installation and Service Guide</i>).</p>	<p>Description: An SSA device on the loop is preventing the completion of the loop configuration.</p> <p>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.</p> <p>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.</p>
44PAA	<b>Disk drive module (100%)</b> (“Disk Drive Modules” on page 151).	<p>Description: A disk drive module has a ‘Failed’ status.</p> <p>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.</p> <p>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.</p>
45PAA	<p><b>Disk drive module (40%)</b> (“Disk Drive Modules” on page 151).</p> <p><b>SSA attachment (40%)</b> (using-system <i>Installation and Service Guide</i>).</p> <p><b>External SSA cables, optical extenders, or main fibre optic cables (18%)</b></p> <p><b>Frame assembly (2%)</b> (“Frame Assembly” on page 216).</p>	<p>Description: The SSA attachment has detected an open SSA loop.</p> <p>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).</p> <p>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 134 to solve the problem.</p>

SRN	FRU List	Problem
46000 to 6FFFF	<b>Not applicable</b>	Description: SRNs in this range are not enclosure (subsystem) SRNs.  Action: For SRNs in this range, see the documentation for your SSA attachment.
7XXXX	<b>None</b>	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. <b>Note:</b> In this SRN, an X represents a digit 0 through F.
80200	<b>None</b>	Description: The 7133 cannot be switched on.  Action: Go to "MAP 2020: 7133 Models D40 and T40 – Power" on page 95.
80203	<b>Disk drive module (100%)</b> ("Disk Drive Modules" on page 151).	Description: A disk drive module has its Check light on.  Action: Exchange the FRU for a new FRU.
80210	<b>Controller card asm (100%)</b> ("Controller Card Assembly" on page 207).	Description: The controller card has failed.  Action: Exchange the FRU for a new FRU.
80211	<b>Operator panel (95%)</b> ("Operator Panel and Disk Drive Status Light Assemblies, Flexible Circuits, and Front Bezel Assembly" on page 190).  <b>Controller card asm (5%)</b> ("Controller Card Assembly" on page 207).	Description: The operator panel has failed.  Action: Exchange the FRUs for new FRUs.
80215	<b>None</b>	Description: The 7133 has an unexpected Check light on.  Action: Go to "MAP 2020: 7133 Models D40 and T40 – Power" on page 95.
8022X	<b>Power supply assembly (95%)</b> ("Power Supply Assemblies" on page 178).  <b>Controller card asm (3%)</b> ("Controller Card Assembly" on page 207).  <b>Frame assembly (2%)</b> ("Frame Assembly" on page 216).	Description: The power supply assembly in position X has failed. <ul style="list-style-type: none"> <li>• 80221 means the power supply assembly in position 1.</li> <li>• 80222 means the power supply assembly in position 2.</li> </ul> Action: Exchange the FRUs for new FRUs.
8023X	<b>Fan assembly (95%)</b> ("Fan Assemblies" on page 188).  <b>Controller card asm (3%)</b> ("Controller Card Assembly" on page 207).  <b>Frame assembly (2%)</b> ("Frame Assembly" on page 216).	Description: The fan assembly in position X has failed. <ul style="list-style-type: none"> <li>• 80231 means the fan assembly in position 1.</li> <li>• 80232 means the fan assembly in position 2.</li> <li>• 80233 means the fan assembly in position 3.</li> </ul> Action: Exchange the FRUs for new FRUs.

SRN	FRU List	Problem
8024X	<p><b>Bypass card (95%)</b> (“Bypass (SNBC) Cards” on page 209).</p> <p><b>Controller card asm (3%)</b> (“Controller Card Assembly” on page 207).</p> <p><b>Frame assembly (2%)</b> (“Frame Assembly” on page 216).</p>	<p>Description: Bypass card SSA port X has failed.</p> <ul style="list-style-type: none"> <li>• 80241 means SSA port 1.</li> <li>• 80242 means SSA port 16.</li> <li>• 80243 means SSA port 4.</li> <li>• 80244 means SSA port 5.</li> <li>• 80245 means SSA port 8.</li> <li>• 80246 means SSA port 9.</li> <li>• 80247 means SSA port 12.</li> <li>• 80248 means SSA port 13.</li> </ul> <p>Action: Exchange the FRU for a new FRU.</p>
80251	<b>None</b>	<p>Description: Critical Over-Temperature has been detected.</p> <p>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 39.</p> <p><b>Note:</b> 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.</p>
80252	<b>None</b>	<p>Description: Over-Temperature Warning level has been exceeded.</p> <p>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 39.</p> <p><b>Note:</b> 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.</p>
80253	<b>None</b>	<p>Description: Critical Under-Temperature has been detected.</p> <p>Action: Take actions to increase the ambient temperature.</p> <p><b>Note:</b> 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.</p>
80254	<b>None</b>	<p>Description: Under-Temperature Warning level has been exceeded.</p> <p>Action: Take actions to increase the ambient temperature.</p>

SRN	FRU List	Problem
80260	<b>None</b>	<p>Description: An empty disk drive module slot has been reported. The slot has been empty for longer than one minute.</p> <p>Action: Use the service functions (see “Service Functions” on page 62) to find the slot that has been reported empty.</p>
80280	<b>None</b>	<p>Description: A disk drive module cannot be configured for some unknown reason.</p> <p>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.</p>
80290	<p><b>Controller card asm (97%)</b> (“Controller Card Assembly” on page 207).</p> <p><b>None (3%)</b></p>	<p>Description: A function has failed because access to the 7133 controller is not possible. This problem might be caused by system activity.</p> <p>Action: Check whether you can get access to the disk drives of the 7133:</p> <ul style="list-style-type: none"> <li>• If you can get access, run the failing function again. If the same SRN is generated, exchange the FRU for a new FRU.</li> <li>• If you cannot get access, solve the problem that prevents access to the disk drives, then run the failing function again.</li> </ul>
D0000	<b>Disk drive module (100%)</b> (“Disk Drive Modules” on page 151).	<p>Description: The using system cannot configure the disk drive module.</p> <p>Action: This is probably a software problem. Try again to configure the disk drive module.</p> <p>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.</p>
D0100	<b>Disk drive module (100%)</b> (“Disk Drive Modules” on page 151).	<p>Description: Unable to clear a disk drive module reservation.</p> <p>Action: Exchange the FRU for a new FRU.</p>
D0101	<b>Disk drive module (100%)</b> (“Disk Drive Modules” on page 151).	<p>Description: The disk drive module has been reserved since the diagnostics started.</p> <p>Action: The disk drive module is in use. Release the disk drive module, and run the diagnostics again.</p>
D0102	<b>None</b>	<p>Description: The command line diagnostics have detected that the device is reserved or fenced out.</p> <p>Action: Use the -u flag to break the reservation or fence.</p> <p><b>Warning:</b> If another using system is using this device, unpredictable results might occur if you break the reservation or fence.</p>

SRN	FRU List	Problem
D0103	<b>None</b>	<p>Description: The diagnostics attempted to break a reservation, but this adapter does not provide support for the function.</p> <p>Action: A different adapter is using the disk drive module. Release the disk drive module, and run the diagnostics again.</p>
D0200	<b>Disk drive module (100%)</b> ("Disk Drive Modules" on page 151).	<p>Description: The disk drive module timed out while the diagnostics were running.</p> <p>Action: Rerun the diagnostics. If the problem remains, exchange the FRU for a new FRU.</p>
D0300	<b>Disk drive module (100%)</b> ("Disk Drive Modules" on page 151).	<p>Description: The disk drive module failed the diagnostic test.</p> <p>Action: Exchange the FRU for a new FRU.</p>
D0400	<b>Disk drive module (100%)</b> ("Disk Drive Modules" on page 151).	<p>Description: The disk drive module is not ready while the diagnostics are running.</p> <p>Action: Rerun the diagnostics. If the problem remains, exchange the FRU for a new FRU.</p>
D0450	<b>None</b>	<p>Description: A Format operation is in progress.</p> <p>Action: The Format operation that was started on this disk drive module has not yet finished.</p> <p>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.</p>
D0460	<b>None</b>	<p>Description: A Format operation has been degraded.</p> <p>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.</p>
D4000 to D6PAA	<b>Not applicable</b>	<p>Description: SRNs in this range are not enclosure (subsystem) SRNs.</p> <p>Action: For SRNs in this range, see the documentation for your SSA attachment.</p>
D8000	<p><b>Controller card asm (99%)</b> ("Controller Card Assembly" on page 207).</p> <p><b>Frame assembly (1%)</b> ("Frame Assembly" on page 216).</p>	<p>Description: The diagnostics cannot get access to the controller.</p> <p>Action: Exchange the FRUs for new FRUs.</p>
D8300	<b>Controller card asm (100%)</b> ("Controller Card Assembly" on page 207).	<p>Description: The diagnostics have detected a controller failure.</p> <p>Action: Exchange the FRU for a new FRU.</p>

SRN	FRU List	Problem
DFFFF	<b>Controller card asm (100%)</b> (“Controller Card Assembly” on page 207).	<p><b>Note:</b> 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.</p> <p>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.</p> <p>Action: Go to Software and Microcode Errors in the “Additional Information” appendix (in this book) for your using system before exchanging the FRU.</p>
SSAXX	<b>None</b>	<p>Description: Service aid error code.</p> <p>Action: See the user or maintenance information for your using-system SSA attachment for details.</p> <p><b>Note:</b> In this SRN, an X represents a digit 0 through F.</p>

---

## 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 22).

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 132 to verify the repair.

- a. Disk drive module (see “Disk Drive Modules” on page 151).
- b. Controller card assembly (see “Controller Card Assembly” on page 207).
- c. Frame assembly (see “Frame Assembly” on page 216).

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 29 or “Internal Connections (Model T40)” on page 31.)

**NO**

- a. Exchange the controller card assembly for a new one (see “Controller Card Assembly” on page 207).
- b. Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 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 8 on page 152 through step 14 on page 154). 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 132 to verify the repair.

- a. Controller card assembly (see “Controller Card Assembly” on page 207).
- b. Frame assembly (see “Frame Assembly” on page 216).

**YES**

- a. Exchange the disk drive module for a new one (see “Disk Drive Modules” on page 151).
- b. Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 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 271)

**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 10.
- 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 step 10, MAP 2022: 7133 Models D40 and T40 – Power-On step 12 on page 102, and MAP Extension step 4 on page 271)

**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, 16, and 17)

**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 18 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 15.

Step 14. (from step 13)

**Do you have SRN 300C0, 301C0, 2A006, or 2A106?**

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

**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” on page 151).
  - b. Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 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 132 to verify the repair.

Step 15. (from step 13)

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

**NO** Go to step 16.

**YES** Go to step 17 on page 92.

Step 16. (from step 15)

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 17 on page 92.

**YES** Go to step 12 on page 90.

Step 17. (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 18. (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 19 on page 93.

**YES**

- a. Exchange the controller card assembly for a new one (see "Controller Card Assembly" on page 207).
- b. Go to "MAP 2410: 7133 Models D40 and T40 – Repair Verification" on page 132 to verify the repair.

Step 19. (from step 18)

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

**NO** Go to step 20 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	80241
BP16	80242
BP4	80243
BP5	80244
BP8	80245
BP9	80246
BP12	80247
BP13	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 20. (from step 19)

**Is the controller card Check light on?**

**NO** Go to step 21.

**YES**

- a. Exchange the controller card assembly for a new one (see “Controller Card Assembly” on page 207).
- b. Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 to verify the repair.

Step 21. (from step 20)

**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 207).
- b. Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 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” on page 151).
- b. Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 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.

**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 178).
- b. Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 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 178).
- b. Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 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 132 to verify the repair.

- a. Controller card assembly (see “Controller Card Assembly” on page 207).
- b. Operator panel (see “Operator Panel and Disk Drive Status Light Assemblies, Flexible Circuits, and Front Bezel Assembly” on page 190).
- c. Frame assembly (see “Frame Assembly” on page 216).

Step 7. (from step 1)

**Are any operator panel lights or the ID display on?**

**NO** Go to step 8.

**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 190).
- b. Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 to verify the repair.

Step 8. (from step 7)

**Does each power supply assembly have its PWR light on?**

**NO** Go to step 9 on page 97.

**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 190).
- b. Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 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 132 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 132 to verify the repair.
  - a. Power cables
  - b. Power switch and cable assembly (see “Power Switch and Cable Assembly (Model T40)” on page 205).

---

## 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 146).

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

- b. Remove both power supply assemblies (see “Power Supply Assemblies” on page 178).
- c. Remove the three fan assemblies (see “Fan Assemblies” on page 188).
- d. Remove all the disk drive modules (see “Disk Drive Modules” on page 151).
- e. Remove the controller card assembly (see “Controller Card Assembly” on page 207).
- f. Remove the four bypass cards (see “Bypass (SNBC) Cards” on page 209).
- 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 178).
  - 2) Frame assembly (see "Frame Assembly" on page 216).
- 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 178).
  - 2) Frame assembly (see "Frame Assembly" on page 216).
- 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)

Reinstall a disk drive module *into the slot from which it was originally removed* (see “Installing a Module” on page 157).

**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 reinstalled.
- b. Go to step 10.

Step 10. (from steps 9 and 11)

Reinstall the next disk drive module *into the slot from which it was originally removed*.

**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 reinstalled.
- b. Go to step 11.

Step 11. (from step 10)

**Have you reinstalled 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 17)

**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 132 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 132 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 132 to verify the repair.
  - 1) The controller card assembly (see “Controller Card Assembly” on page 207)
  - 2) The power supply assembly that is in position 1 (see “Power Supply Assemblies” on page 178)
  - 3) Frame assembly (see “Frame Assembly” on page 216)

**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 132 to verify the repair.
- a. Remote-power-on control unit (see “Remote-Power-On Control Unit” on page 212)
  - 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 132 to verify the repair.
  - 1) Remote-power-on control unit (see “Remote-Power-On Control Unit” on page 212).
  - 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 132 to verify the repair.
  - 1) Remote-power-on control unit (see “Remote-Power-On Control Unit” on page 212).
  - 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 132 to verify the repair.
  - 1) Remote-power-on control unit (see “Remote-Power-On Control Unit” on page 212).
  - 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 132 to verify the repair.

- a. The power supply assembly whose CHK/PWR-GOOD light shows green (see “Power Supply Assemblies” on page 178)
- b. Controller card assembly (see “Controller Card Assembly” on page 207)
- c. Frame assembly (see “Frame Assembly” on page 216)

**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 132 to verify the repair.

- a. Remote-power-on control unit (see “Remote-Power-On Control Unit” on page 212)
- 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 207)
- d. The power supply assembly whose CHK/PWR-GOOD light shows green
- e. Frame assembly (see “Frame Assembly” on page 216)

**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 132 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 132 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 132 to verify the repair.

- a. Remote-power-on control unit (see “Remote-Power-On Control Unit” on page 212).
- 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).

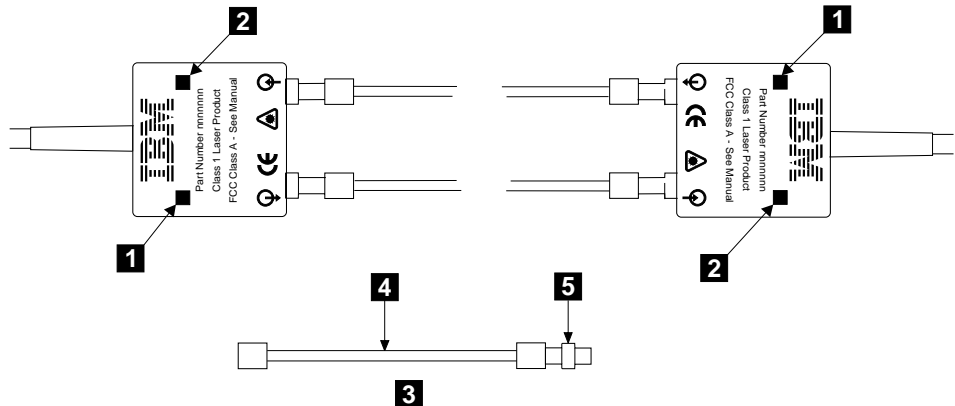


Figure 43. Optical Extender with a Wrap Cable and Adapter Assembly

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 23.)

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 27).



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 27).

**Does the problem remain?**

**NO** Go to “MAP 2410: 7133 Models D40 and T40 – Repair Verification” on page 132 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 132 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.

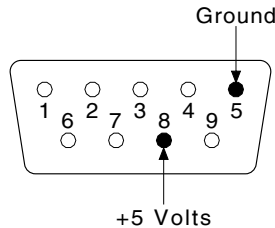


Figure 44. SSA Connector Pins

- 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 132 to verify the repair.
  - a. The first disk drive module in the string whose connector you have just checked (see “Disk Drive Modules” on page 151).  
For information about disk drive module strings, see “Internal Connections (Model D40)” on page 29 or “Internal Connections (Model T40)” on page 31.
  - b. If present, the dummy disk drive modules that are between the connector and the first disk drive module of the string (see “Dummy Disk Drive Modules” on page 168).
  - c. The bypass card containing the connector that you have just checked (see “Bypass (SNBC) Cards” on page 209).
- 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 132 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 132 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 132 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 132 to verify the repair.
    - 1) The first disk drive module in the string whose connector you have just checked (see “Disk Drive Modules” on page 151).

For information about disk drive module strings, see “Internal Connections (Model D40)” on page 29 or “Internal Connections (Model T40)” on page 31.
    - 2) If present, the dummy disk drive modules that are between the connector and the first disk drive module of the string (see “Dummy Disk Drive Modules” on page 168).
    - 3) The bypass card into which the new optical extender is plugged (see “Bypass (SNBC) Cards” on page 209).
  - 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 132 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 132 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.

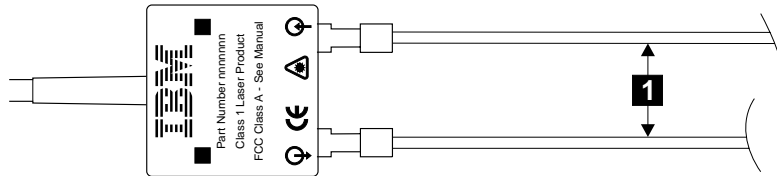


Figure 45. Optical Extender and Fibre Optic Cables

- 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.

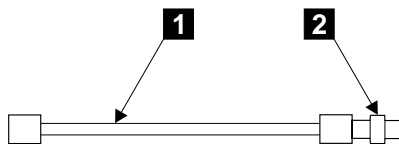


Figure 46. Wrap Cable and Wrap Adapter

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

- i. Refer to Figure 47.

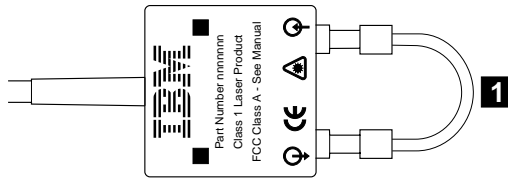


Figure 47. Wrapped Optical Extender

- 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 132 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.

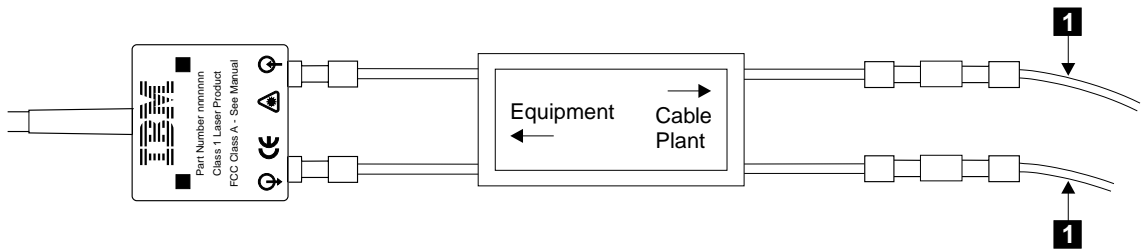


Figure 48. Multi-Mode Conditioner and Main Fibre Optic Cables

- 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.

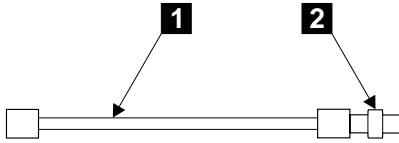


Figure 49. Wrap Cable and Wrap Adapter

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

i. Refer to Figure 50.

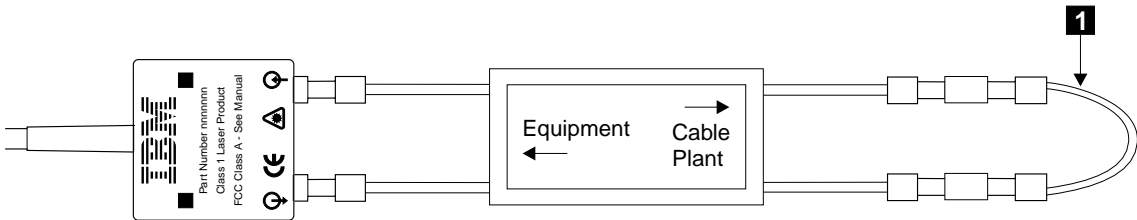


Figure 50. Wrapped Multi-Mode Conditioner

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 132 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.

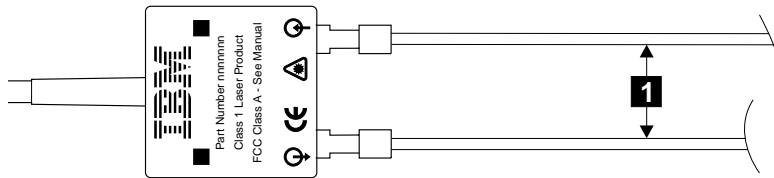


Figure 51. Optical Extender and Fibre Optic Cables

- 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.

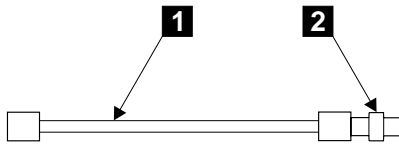


Figure 52. Wrap Cable and Wrap Adapter

- i. Disconnect the wrap cable **1** from the wrap adapter **2**.
- j. Refer to Figure 53.

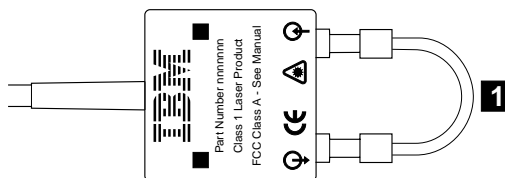


Figure 53. Wrapped Optical Extender

- 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 132 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.

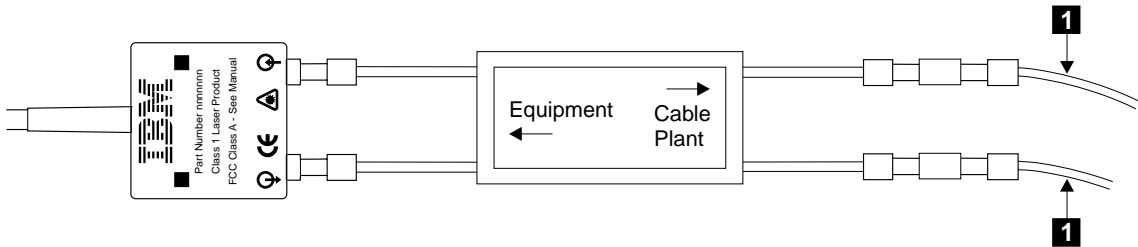


Figure 54. Multi-Mode Conditioner and Main Fibre Optic Cables

- 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.

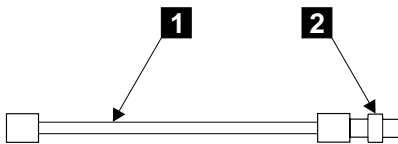


Figure 55. Wrap Cable and Wrap Adapter

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

i. Refer to Figure 56.

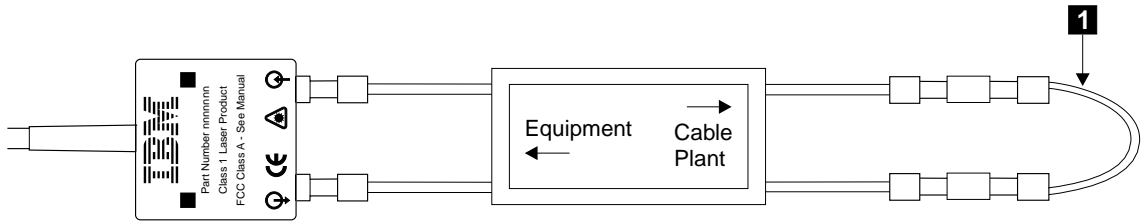


Figure 56. Wrapped Multi-Mode Conditioner

- 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 132 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.

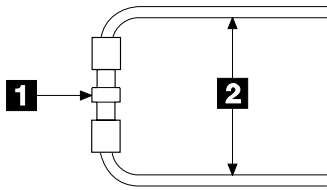


Figure 57. Wrapped Main Fibre Optic Cables

- 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 132 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.

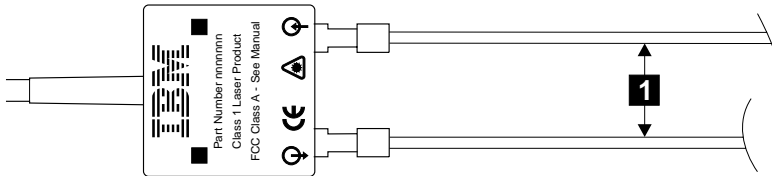


Figure 58. Optical Extender and Fibre Optic Cables

- 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.

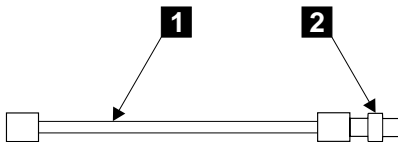


Figure 59. Wrap Cable and Wrap Adapter

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



i. Refer to Figure 60.

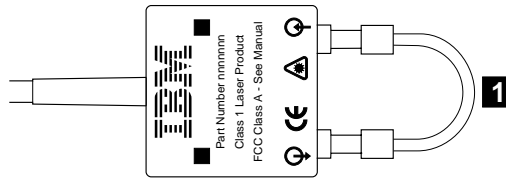


Figure 60. Wrapped Optical Extender

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 132 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 on page 129.

**YES**     Go to step 19 on page 131.

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 132 to verify the repair.
  - 1) The disk drive module (see “Disk Drive Modules” on page 151).
  - 2) If present, the dummy disk drive modules that are between the connector and the first disk drive module of the string (see “Dummy Disk Drive Modules” on page 168).
  - 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 130.

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 132 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 132 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.

(from MAP 2010: 7133 Models D40 and T40 – START steps 4, 5, 6, 14, 17, 18, 20, and 21

MAP 2020: 7133 Models D40 and T40 – Power steps 5, 6, 7, 8, and 11

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

Feature steps 1, 2, 4, 5, 6, 7, 8, and 9

MAP 2330: 7133 Models D40 and T40 – Optical Extender steps 1, 5, 6, 9, 12, 15, 17, 18, and 19)

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 on page 133.

**YES** Go to step 2 on page 133.

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 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.

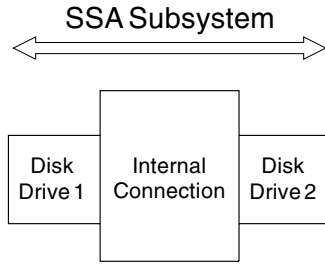


Figure 61. Three-Part Link in One Subsystem

### 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.

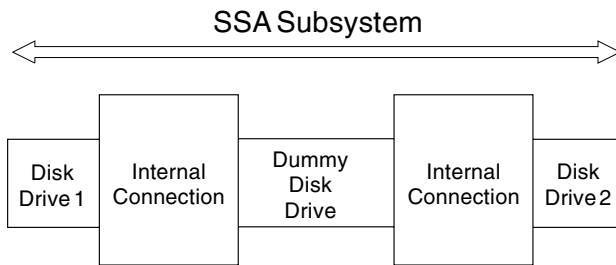


Figure 62. Five-Part Link in One SSA Subsystem

### Example 3

In Figure 63 on page 136, the SSA link is between two disk drive modules that are not in the same SSA subsystem or 7133. It has seven parts.

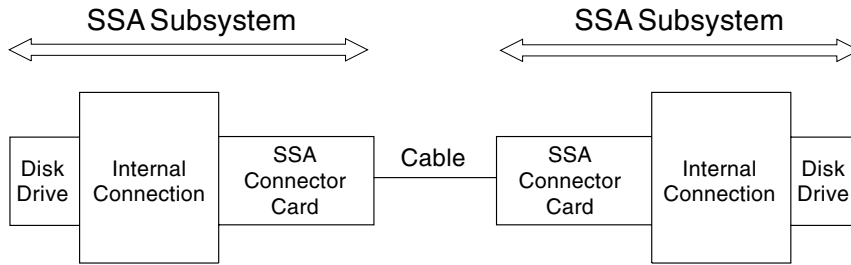


Figure 63. Seven-Part Link in One Subsystem

#### Example 4

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

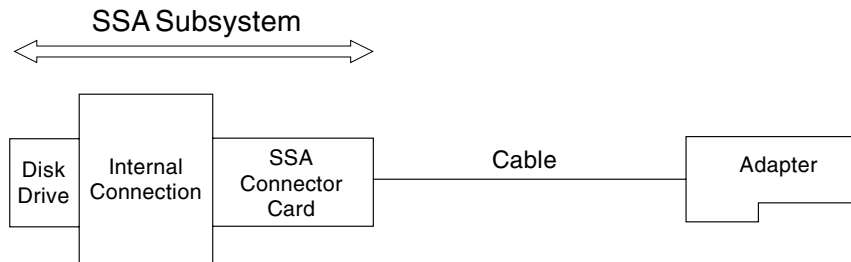


Figure 64. Five-Part Link between Disk Drive Module and SSA Attachment

#### 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.

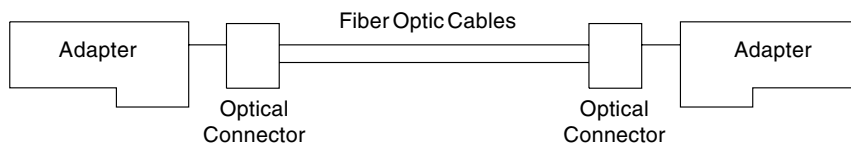


Figure 65. Five-Part Link between Two Adapters

### 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: <ul style="list-style-type: none"> <li>• The path through this port is not operational.</li> <li>• The card is switched into Bypass state (mode light shows amber).</li> <li>• The card is jumpered for Forced Inline mode (mode light shows green).</li> </ul>
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. For example:

1. Remove the front cover (see “Covers” on page 141).
2. Remove all the disk drive modules (see “Removing a Module” on page 151).
3. ....

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

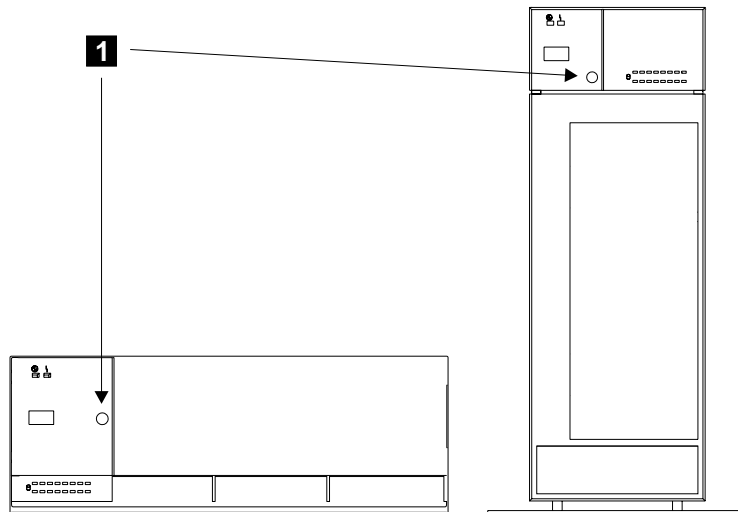
This section describes how to:

- 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

1. Refer to Figure 66.



*Figure 66. Opening the Operator Panel Flap*

2. Press and release the latch button **1**. The flap pivots to the left.

## Front Cover (Model D40)

Step 1. Refer to Figure 67.

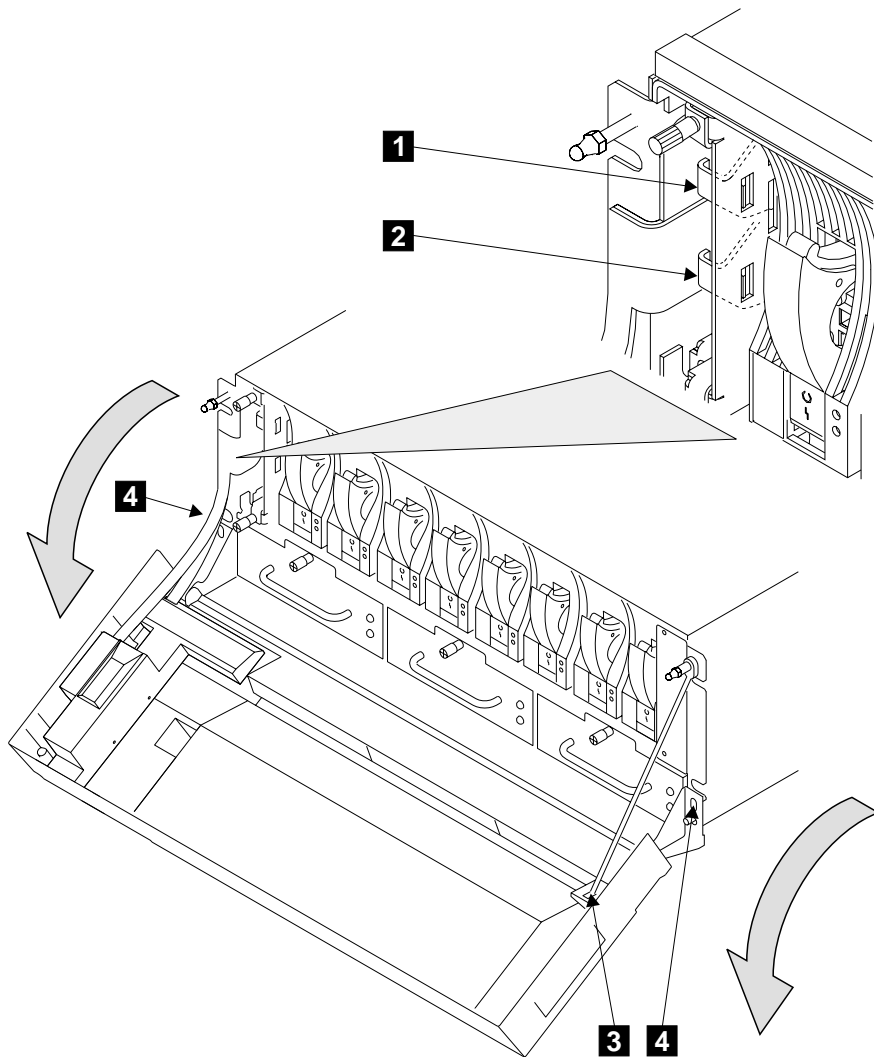


Figure 67. Opening or Removing the Front Cover of Model D40

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. 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.

- b. Do the same actions with the latch **1** to unplug the disk-drive-status-light flexible circuit from the controller card assembly.
- c. Disconnect the support strap **3** from the front cover.
- d. Unscrew the two screws **4** , and remove the front cover assembly.

Step 4. Replace parts in the reverse order.

**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 68.

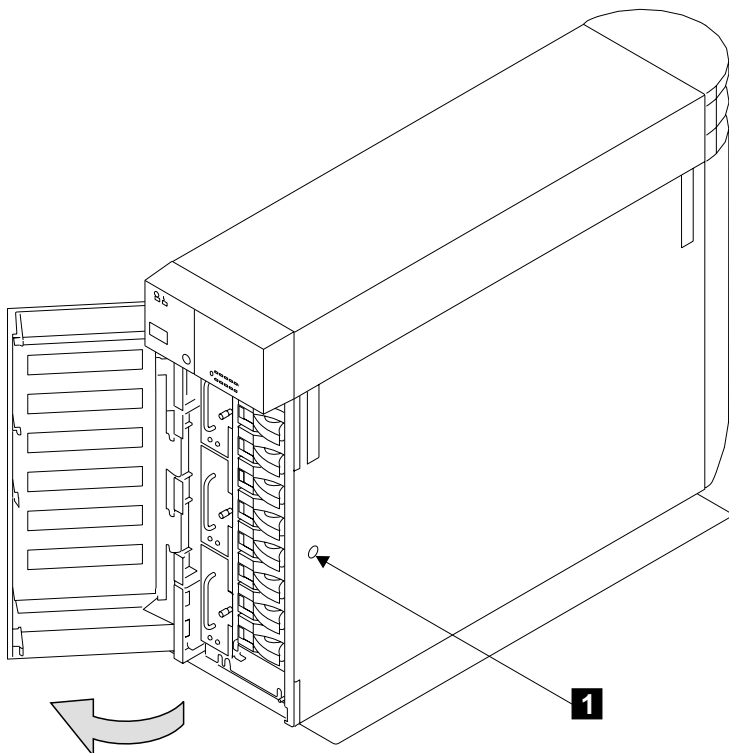


Figure 68. Opening the Front Cover of a Model T40

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 69.

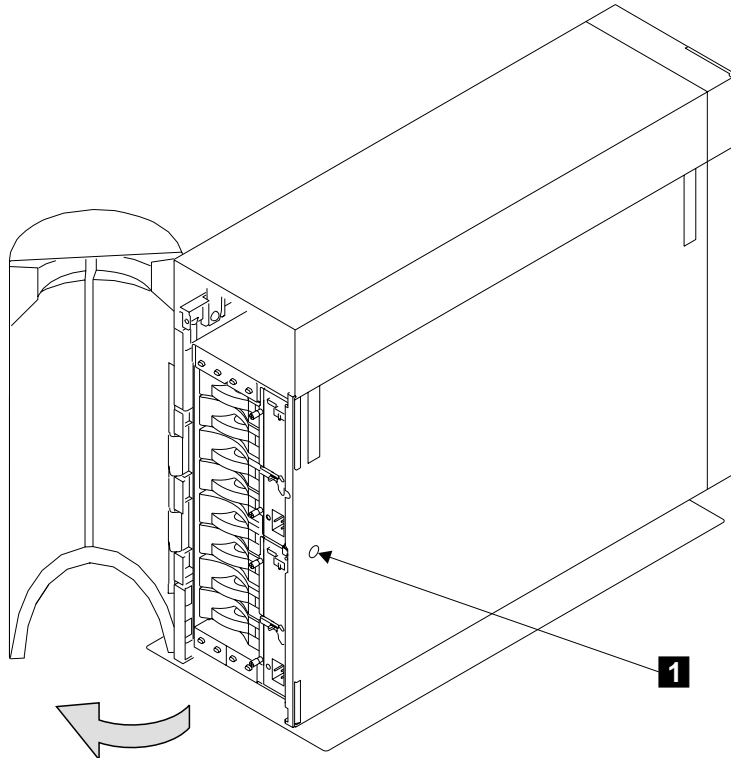


Figure 69. Opening the Back Cover of a Model T40

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 147
- “Power (Model T40)” on page 149.

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 70.

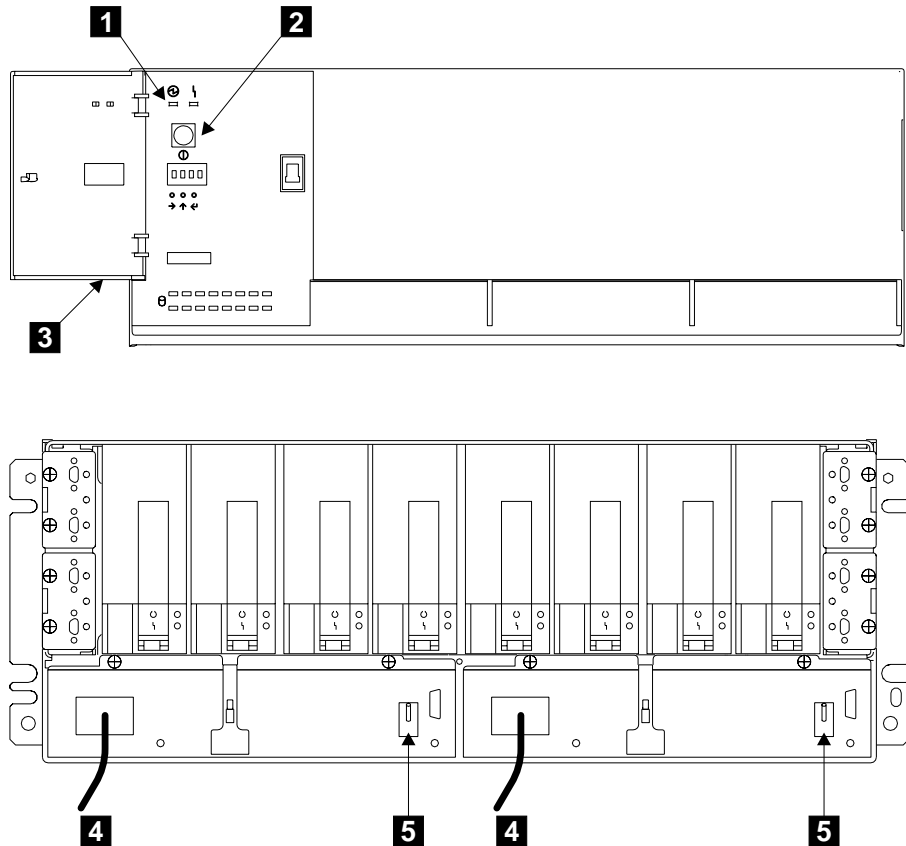


Figure 70. Removing the Power from a Model D40

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 141).

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 71.

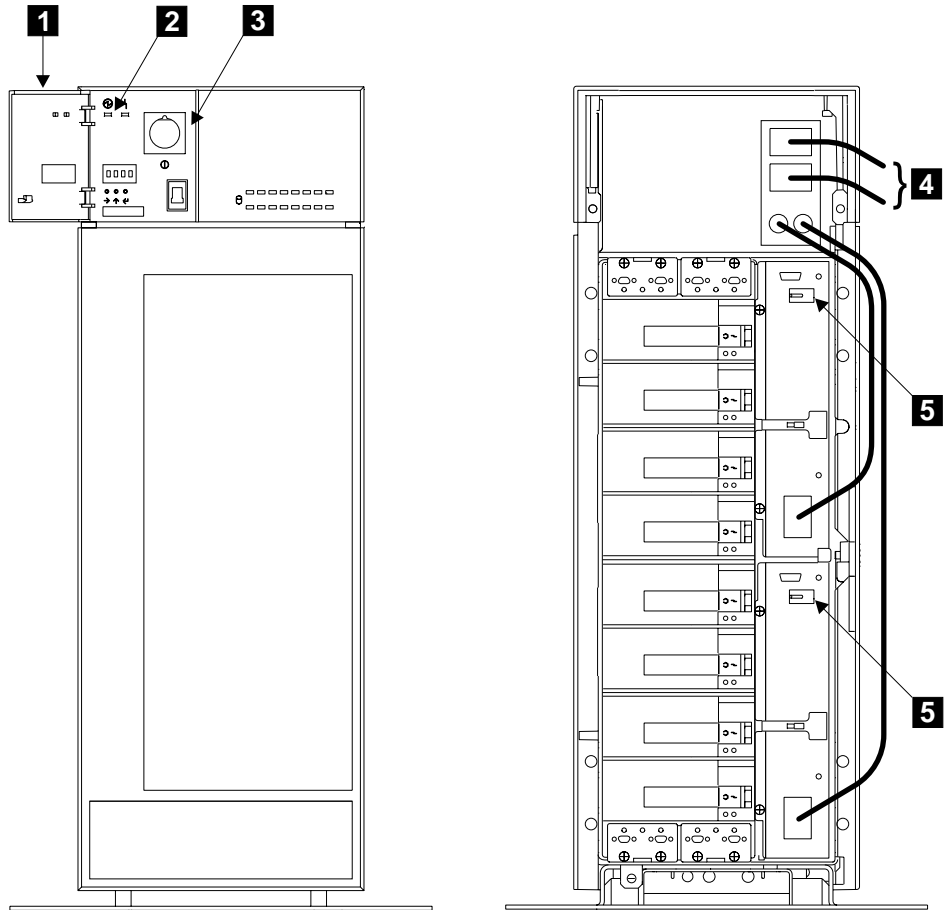


Figure 71. Removing Power from a Model T40

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 141).

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 141).

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

**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.
  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 disk drive module that you are going to remove (see “Physical Location of a Device” on page 59).
- Step 2. If not already done:
- Open the front cover if you are removing a disk drive module from the front of the 7133.
  - Open the back cover if you are removing a disk drive module from the back of a Model T40.
- Step 3. Observe the Check light on the disk drive module that you are going to remove. If the light is on, go to step 8 on page 152. Otherwise, go to step 4.
- Step 4. If you are removing the disk drive module under concurrent maintenance (see “Concurrent Maintenance” on page 139), 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 5. If necessary, use the Identify function to find the disk drive module that you want to remove.
- Step 6. 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 7. 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 8 through 16.
- 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 8. Refer to Figure 72.

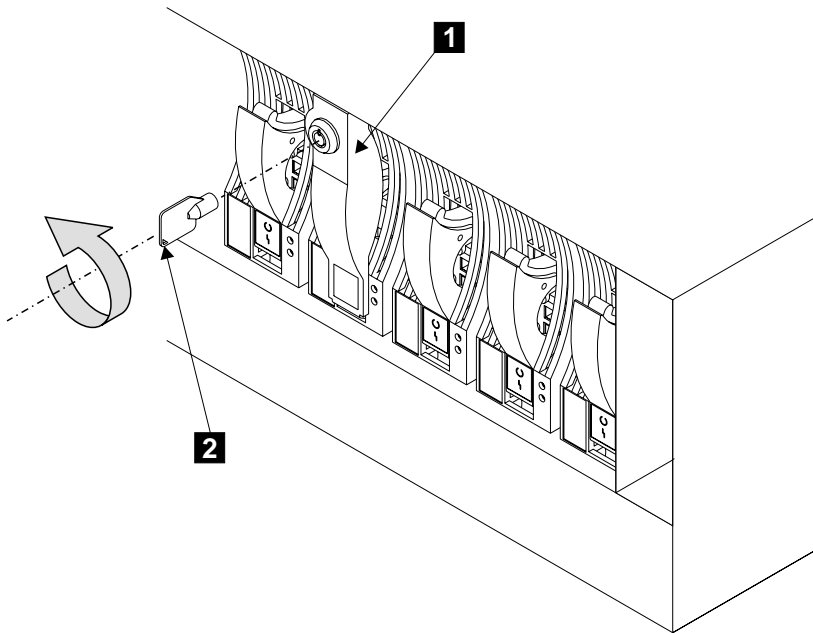


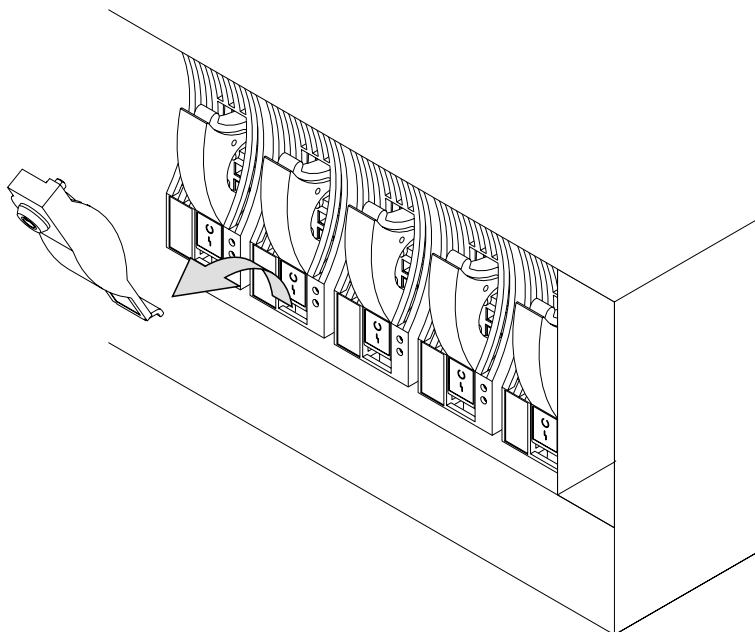
Figure 72. Removing the Lock from a Disk Drive Module (1)

Step 9. If the disk drive module has a lock **1**, go to step 10.

If the disk drive module does not have a lock, go to step 13 on page 154.

Step 10. Ask the customer for the key. Insert the key **2** into the lock, then turn the key counterclockwise.

Step 11. Refer to Figure 73.



*Figure 73. Removing the Lock from a Disk Drive Module (2)*

Step 12. Pull the lock forward, then upward, to remove it.

Step 13. Refer to Figure 74.

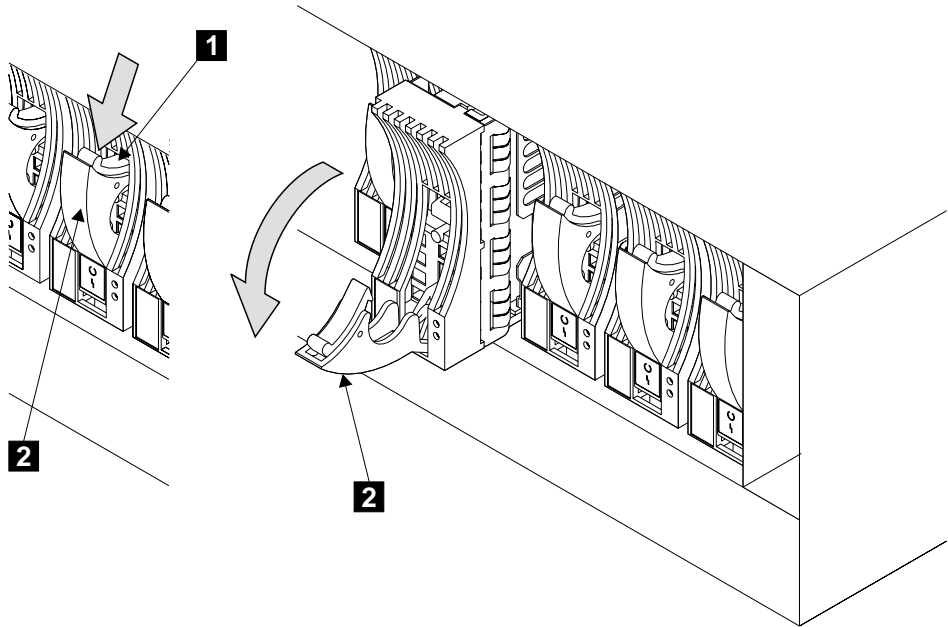
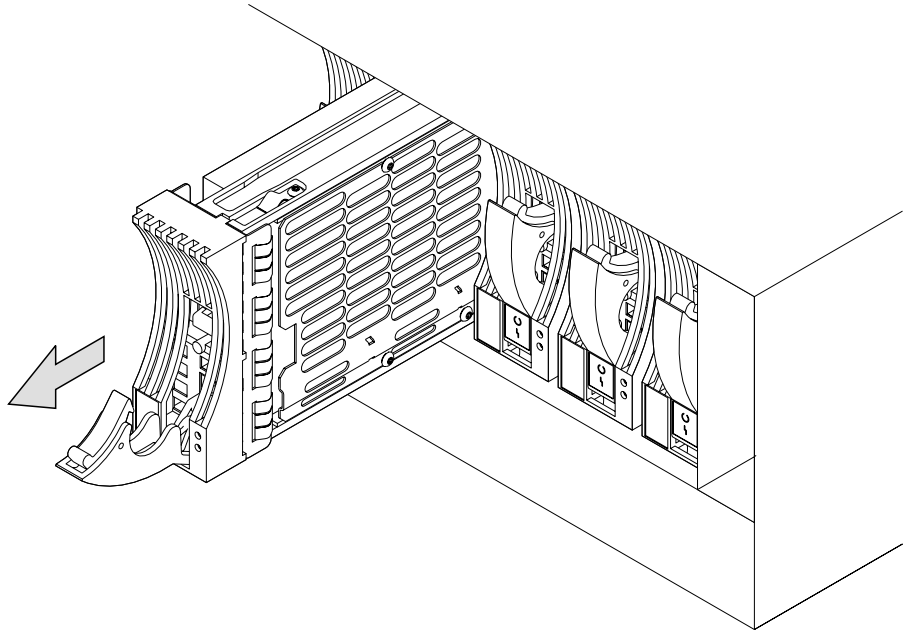


Figure 74. Opening the Handle of a Disk Drive Module

Step 14. Press the blue latch **1**, and pull down the handle **2** fully. This action pulls the disk drive module partially out of its slot.

Step 15. Refer to Figure 75.



*Figure 75. Removing a Disk Drive Module*

Step 16. Grip the handle, and carefully pull out the disk drive module. As the module comes out, put one hand under its base to prevent it from falling.

Step 17. Refer to Figure 76.

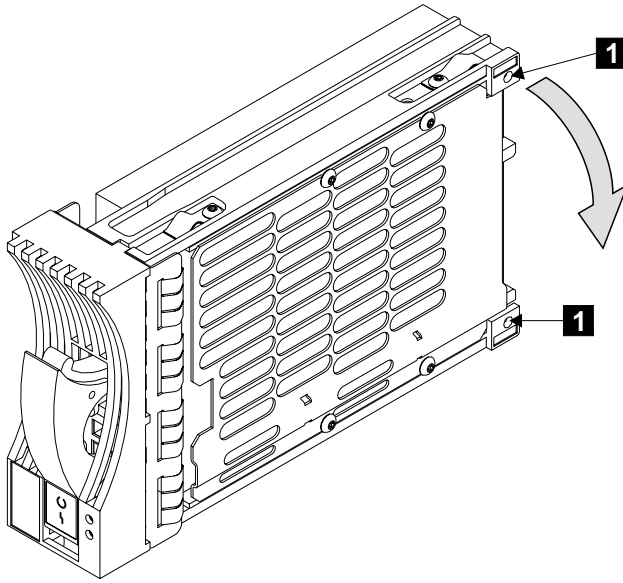


Figure 76. Placing a Disk Drive Module into a Safe Position

Step 18. Lay down the disk drive module so that it rests on the supports **1**.

Step 19. **Attention:** 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.

If you are not going to install a disk drive module into the empty slot, go to “Installing a Dummy Module” on page 174, and install a dummy disk drive module.

Step 20. If you exchanging the disk drive module for another, go to “Installing a Module” on page 157.

If you exchanging the disk drive module for a dummy disk drive module, go to “Installing a Dummy Module” on page 174.

## 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.
- A –48 volt 7133 Model D40 that is connected to a 15-amp circuit breaker and contains at least one 18.2 GB, 10020 rpm disk drive module must contain no more than nine disk drive modules. Otherwise, no limitations exist for other types of disk drive module.

If the 7133 is connected to a 20-amp circuit breaker, no limitations exist for any types of disk drive module.

### 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.
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 you are **reinstalling** a disk drive module and the covers of the 7133 have not been reinstalled since you removed that module, or if you are installing an exchange disk drive module, go to step 5 on page 163. Otherwise, go to step 2.

If you installing a disk drive module into a spare slot, go to step 2.

Step 2. If not already done:

- Open the front cover (see “Covers” on page 141) if you are installing a disk drive module into the front of the 7133.
- Open the back cover (see “Covers” on page 141) if you are installing a disk drive module into the back of a Model T40.

Step 3. If you are installing a disk drive module into a spare slot, go to step 4 on page 158. Otherwise, go to step 5 on page 163.

- Step 4. Remove the dummy disk drive module from the slot:  
a. Refer to Figure 77.

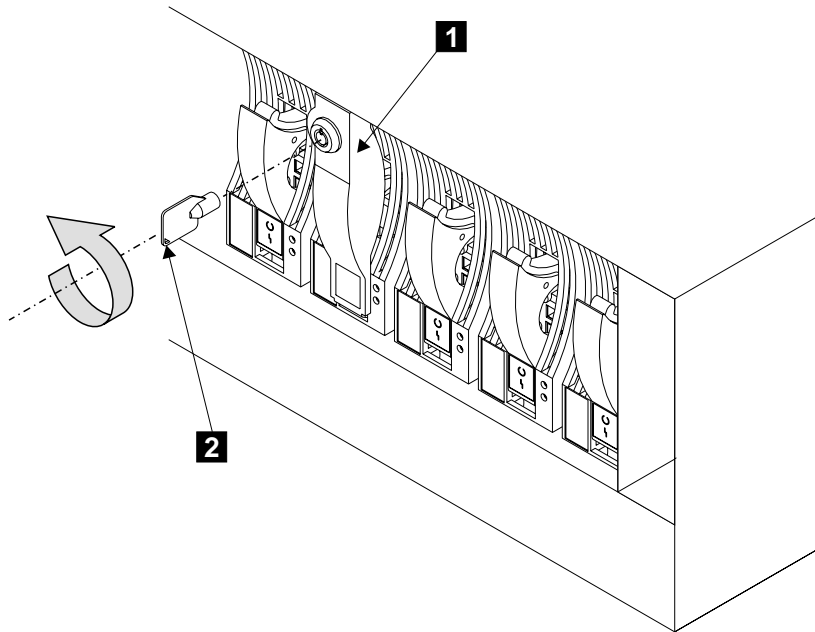
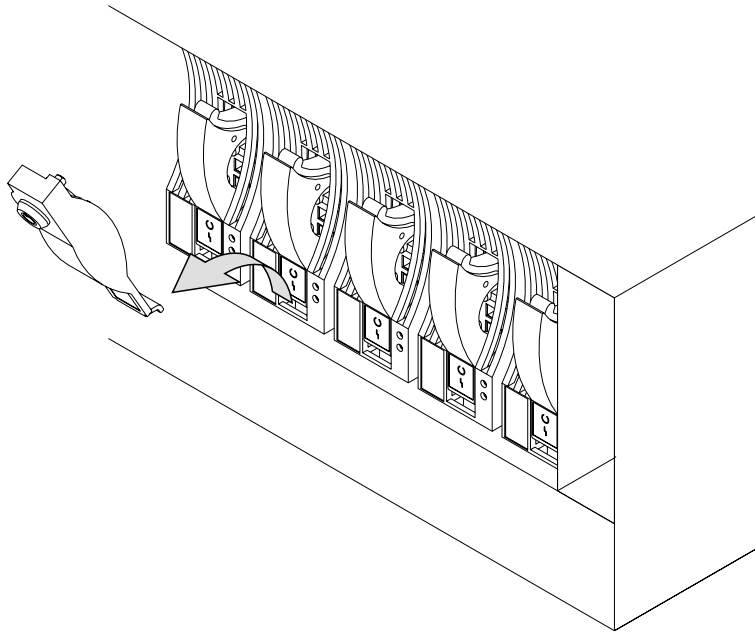


Figure 77. Removing the Lock from a Dummy Disk Drive Module (1)

- b. If the dummy disk drive module has a lock **1**, go to step 4c.  
If the dummy disk drive module does not have a lock, go to step 4f on page 160.
- c. Ask the customer for the key. Insert the key **2** into the lock, then turn the key counterclockwise.



d. Refer to Figure 78.



*Figure 78. Removing the Lock from a Dummy Disk Drive Module (2)*

e. Pull the lock forward, then upward, to remove it.

f. Refer to Figure 79

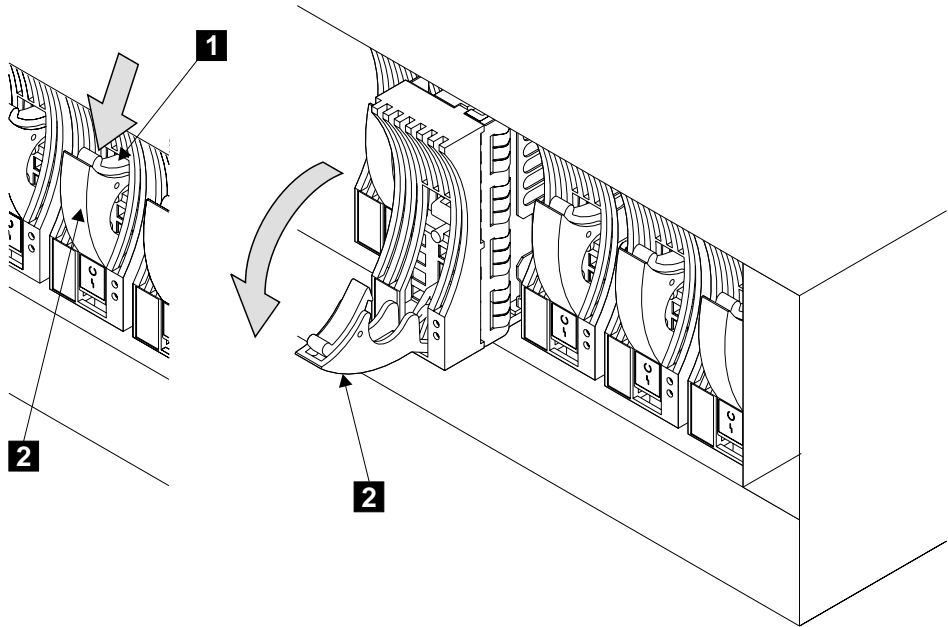
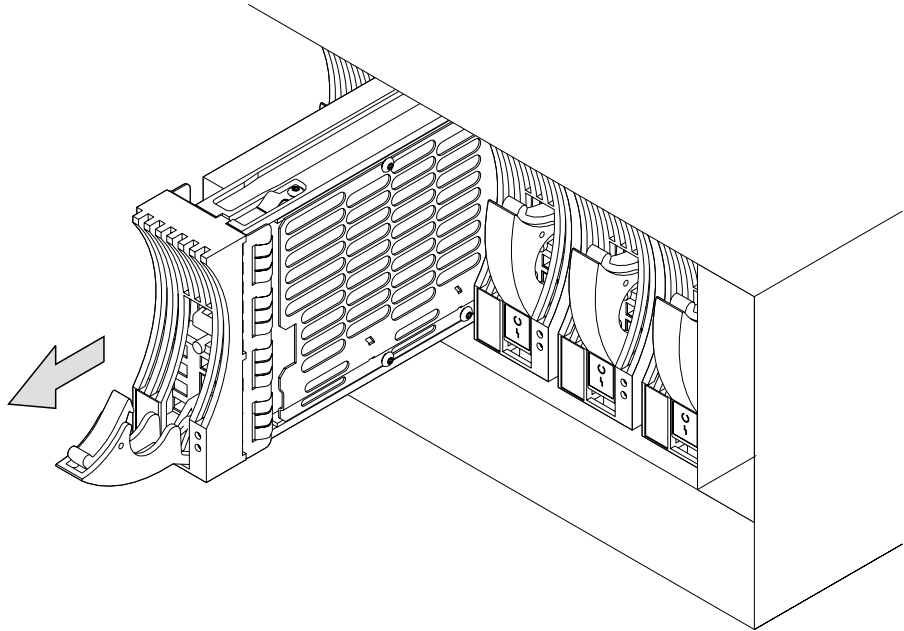


Figure 79. Opening the Handle of a Dummy Disk Drive Module

g. Press the blue latch **1**, and pull down the handle **2** fully. This action pulls the dummy disk drive module partially out of its slot.

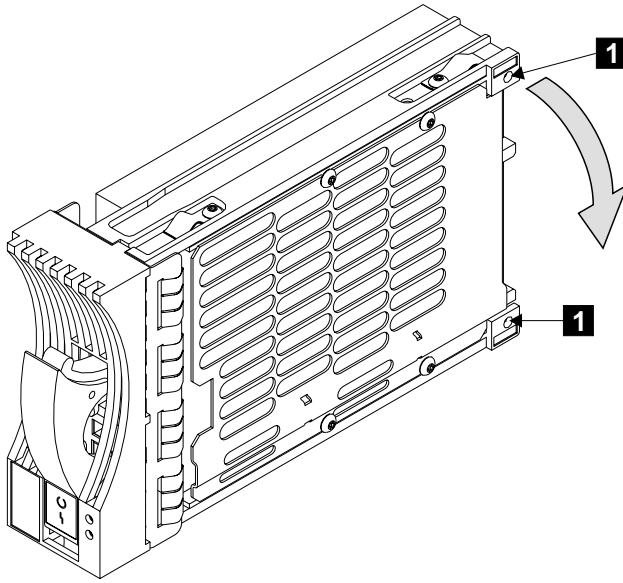
h. Refer to Figure 80.



*Figure 80. Removing a Dummy Disk Drive Module*

- i. Grip the handle, and carefully pull out the dummy disk drive module. As the module comes out, put one hand under its base to prevent it from falling.

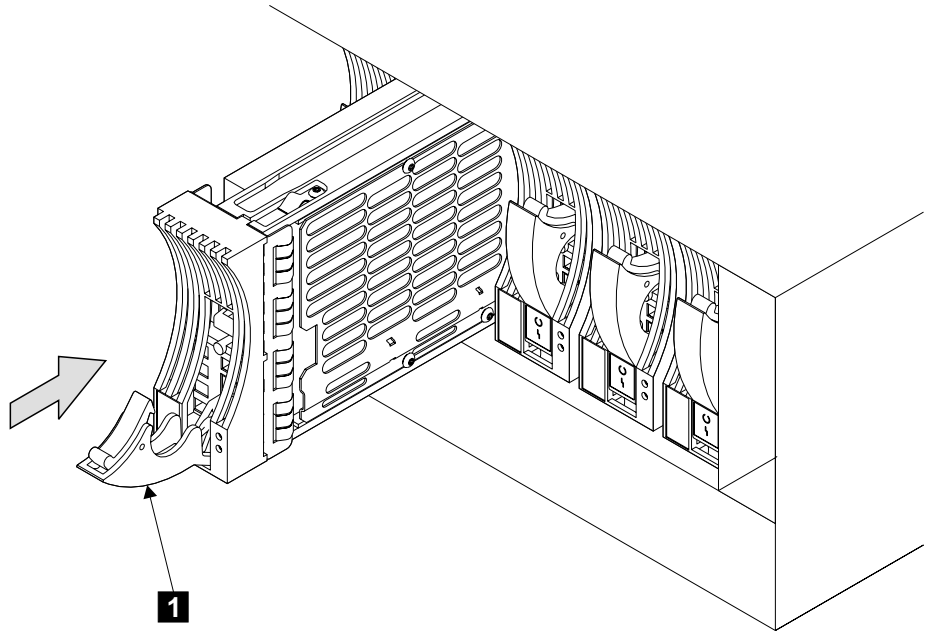
j. Refer to Figure 81.



*Figure 81. Placing a Dummy Disk Drive Module into a Safe Position*

k. Lay down the dummy disk drive module so that it rests on the supports **1**.

Step 5. Refer to Figure 82.



*Figure 82. Installing a Disk Drive Module*

- Step 6. Ensure that the handle **1** is fully open on the disk drive module that you are going to install.
- Step 7. 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 8. Refer to Figure 83

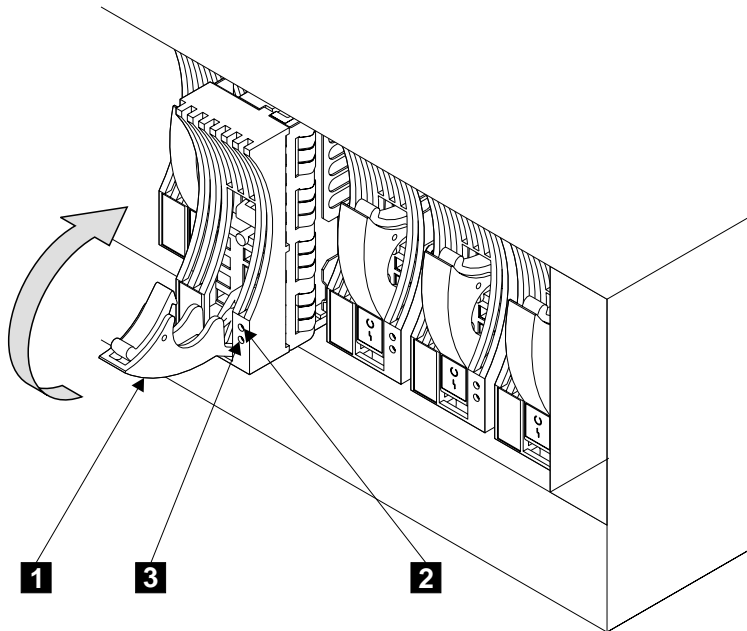


Figure 83. Closing the Handle of a Disk Drive Module

Step 9. Close the handle **1**. Press it in until you hear a click. This action pushes the module fully home.

Step 10. If the 7133 is switched on:

- a. Ensure that the Check light **3** comes on immediately.
  - If it comes on, go to step 10b.
  - 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 10b.
- b. Check whether the Check light goes off after approximately two seconds.
  - If the Check light goes off, go to step 10c.
  - 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 10c.
  - 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 10c.
- 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 11.
- 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 11.

Step 11. Refer to Figure 84

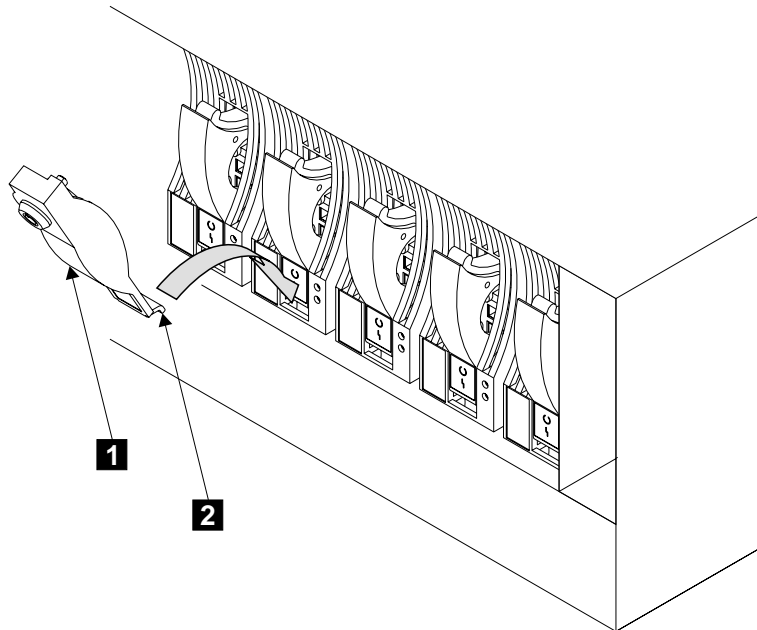


Figure 84. Installing the Lock onto a Disk Drive Module (1)

Step 12. If the disk drive module has a lock **1**, go to step 13.

If the disk drive module does not have a lock, go to step 17 on page 166.

Step 13. Insert the flange **2** of the lock into the slot in the front of the disk drive module.

Step 14. Refer to Figure 85.

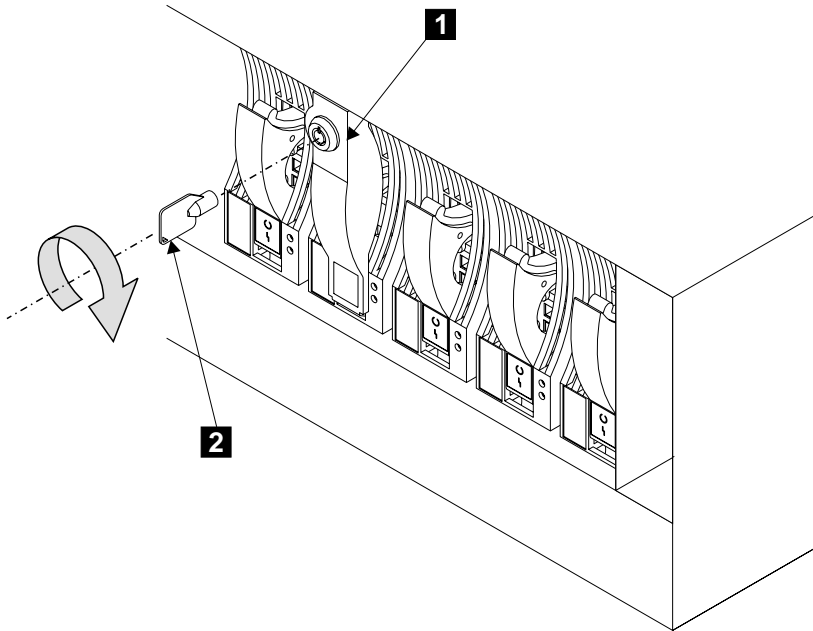


Figure 85. Installing the Lock onto a Disk Drive Module (2)

Step 15. Push the lock **1** over the handle of the disk drive module.

Step 16. Insert the key **2** into the lock, then turn the key clockwise. Return the key to the customer.

Step 17. Replace other parts in the reverse order.

Step 18. If you installed the disk drive module under concurrent maintenance (see “Concurrent Maintenance” on page 139), 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.

---

## Dummy Disk Drive Modules

**Attention:** 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 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.

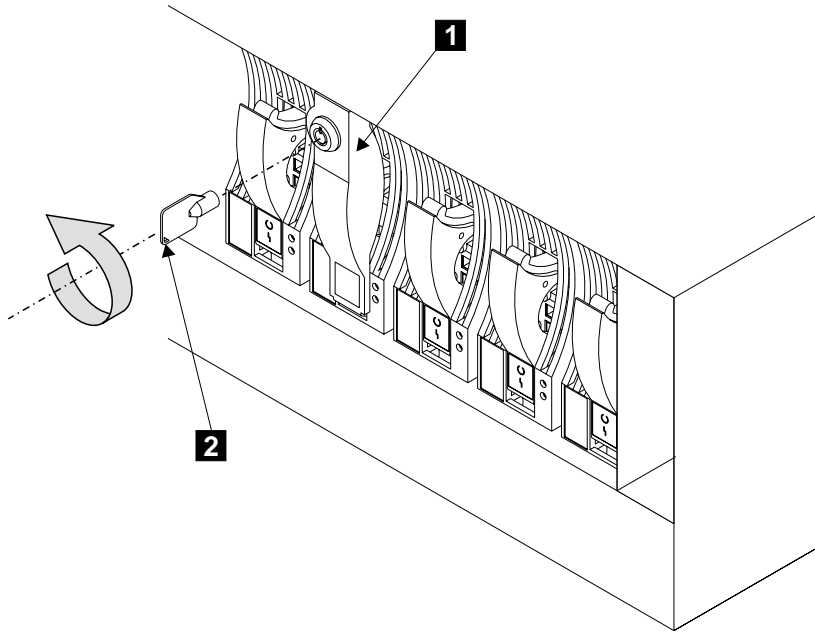
## Removing a Dummy Module

**Attention:** If you are removing the dummy disk drive module under concurrent maintenance (see “Concurrent Maintenance” on page 139), use a link verification service aid to ensure that the SSA loop from which you are removing the module is complete. (For information about the service aid, see the user or maintenance information for your using-system SSA attachment.) If the loop is broken, repair it before continuing with these instructions.

Step 1. If not already done:

- Open the front cover (see “Covers” on page 141) if you are removing a dummy disk drive module from the front of the 7133.
- Open the back cover (see “Covers” on page 141) if you are removing a dummy disk drive module from the back of a Model T40.

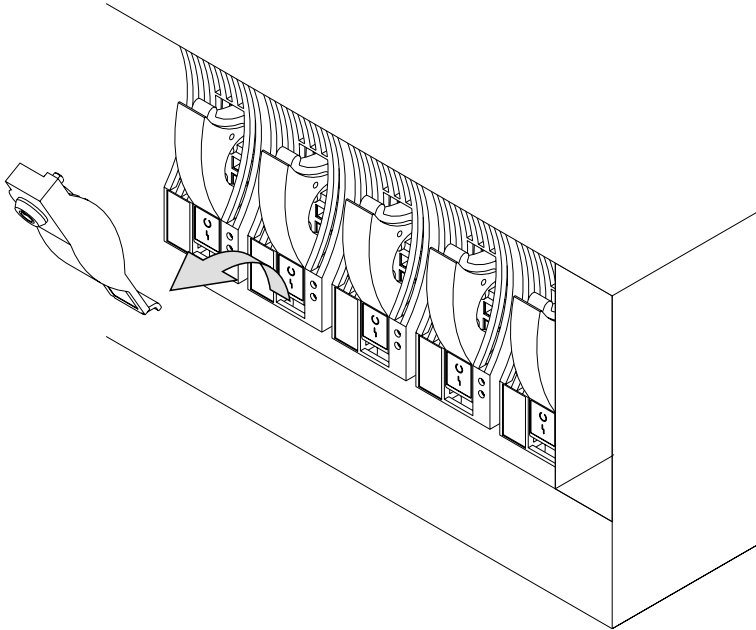
Step 2. Refer to Figure 86.



*Figure 86. Removing the Lock from a Dummy Disk Drive Module (1)*

- Step 3. If the dummy disk drive module has a lock **1**, go to step 4.  
If the dummy disk drive module does not have a lock, go to step 7 on page 171.
- Step 4. Ask the customer for the key. Insert the key **2** into the lock, then turn the key counterclockwise.

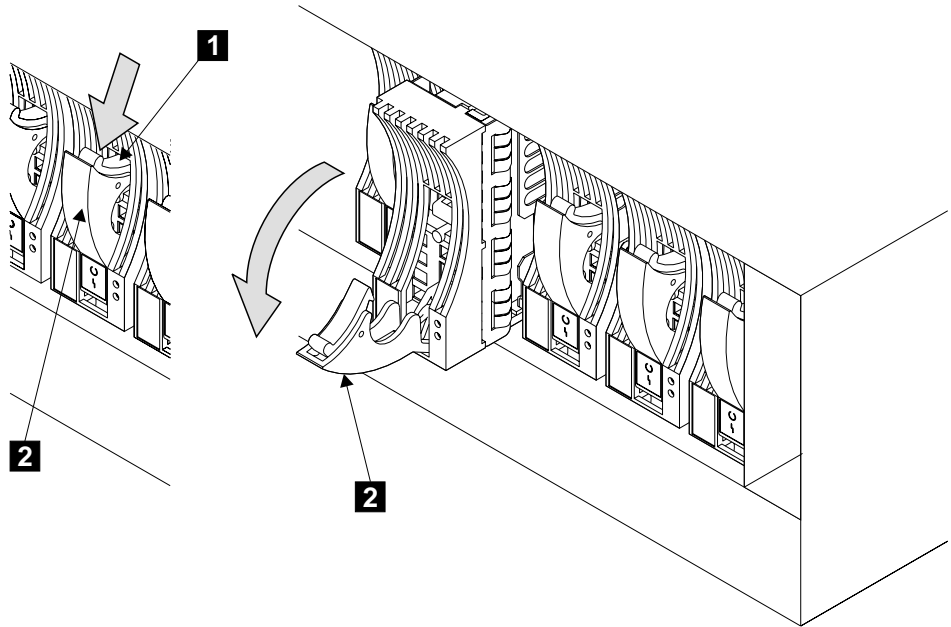
Step 5. Refer to Figure 87.



*Figure 87. Removing the Lock from a Dummy Disk Drive Module (2)*

Step 6. Pull the lock forward, then upward, to remove it.

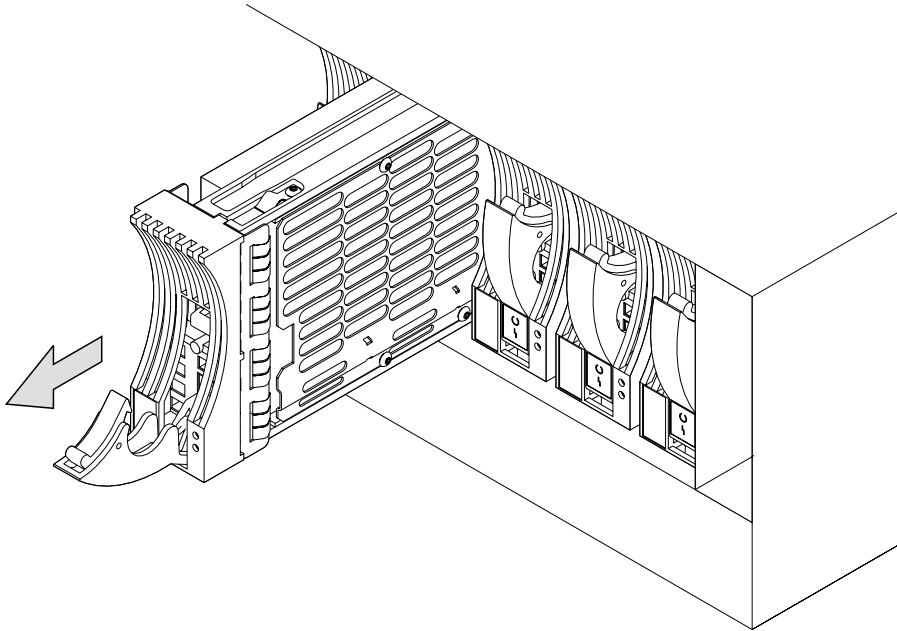
Step 7. Refer to Figure 88



*Figure 88. Opening the Handle of a Dummy Disk Drive Module*

Step 8. Press the blue latch **1**, and pull down the handle **2** fully. This action pulls the dummy disk drive module partially out of its slot.

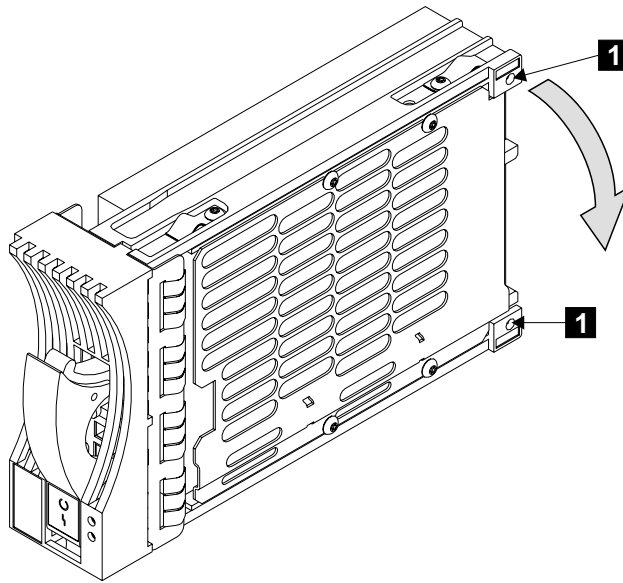
Step 9. Refer to Figure 89



*Figure 89. Removing a Dummy Disk Drive Module*

Step 10. Grip the handle, and carefully pull out the dummy disk drive module. As the module comes out, put one hand under its base to prevent it from falling.

Step 11. Refer to Figure 90.



*Figure 90. Placing a Dummy Disk Drive Module into a Safe Position*

Step 12. Lay down the dummy disk drive module so that it rests on the supports **1**.

## Installing a Dummy Module

Step 1. Refer to Figure 91

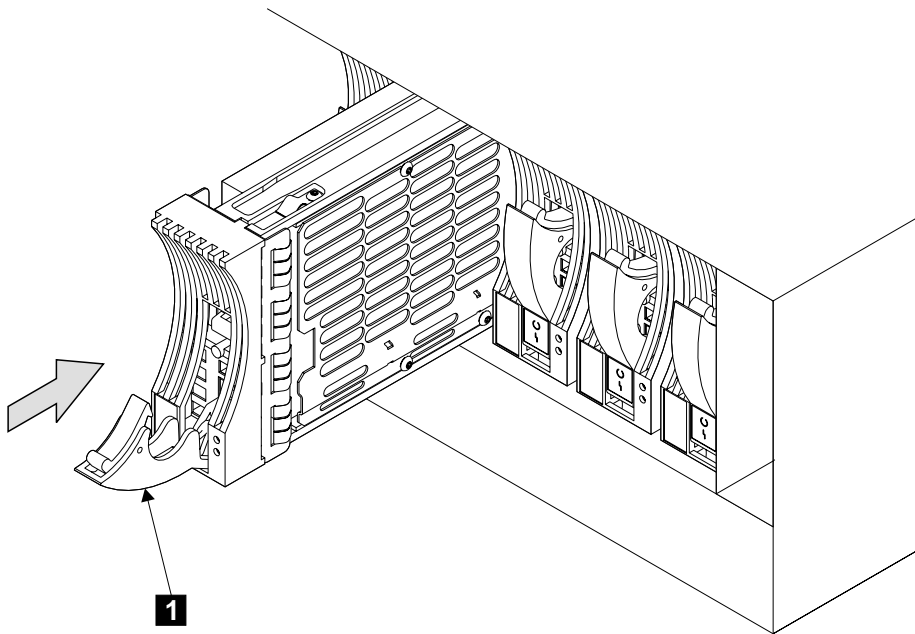


Figure 91. Installing a Dummy Disk Drive Module

- Step 2. Ensure that the handle **1** is fully open on the dummy disk drive module that you are going to install.
- Step 3. 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 4. Refer to Figure 92

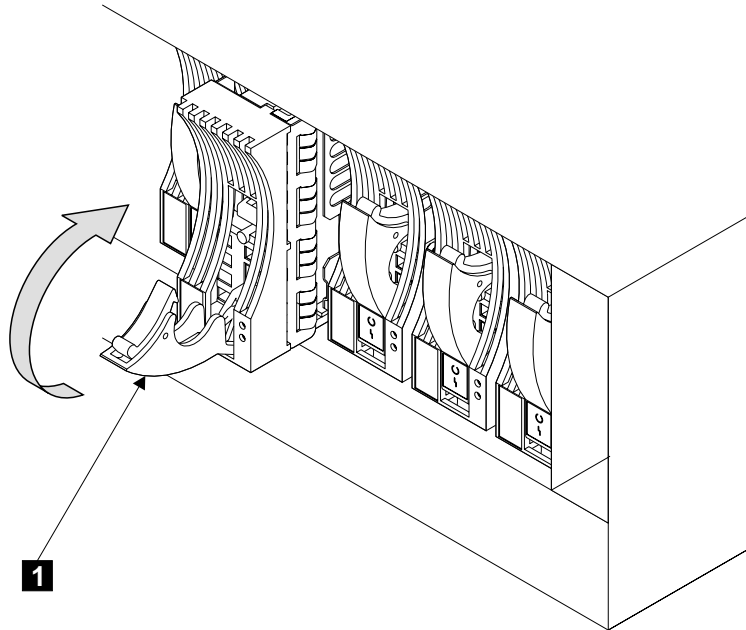


Figure 92. Closing the Handle of a Dummy Disk Drive Module

Step 5. Close the handle **1**. Press it in until you hear a click. This action pushes the module fully home.

Step 6. Refer to Figure 93

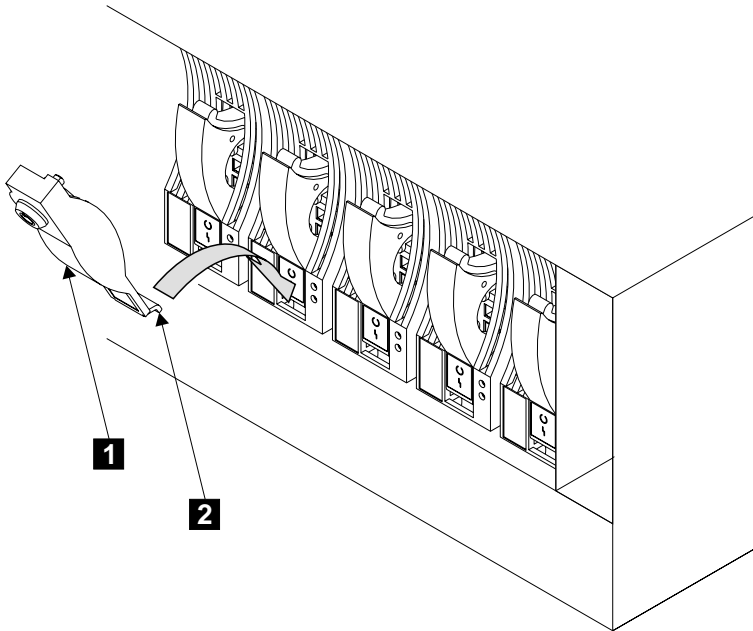
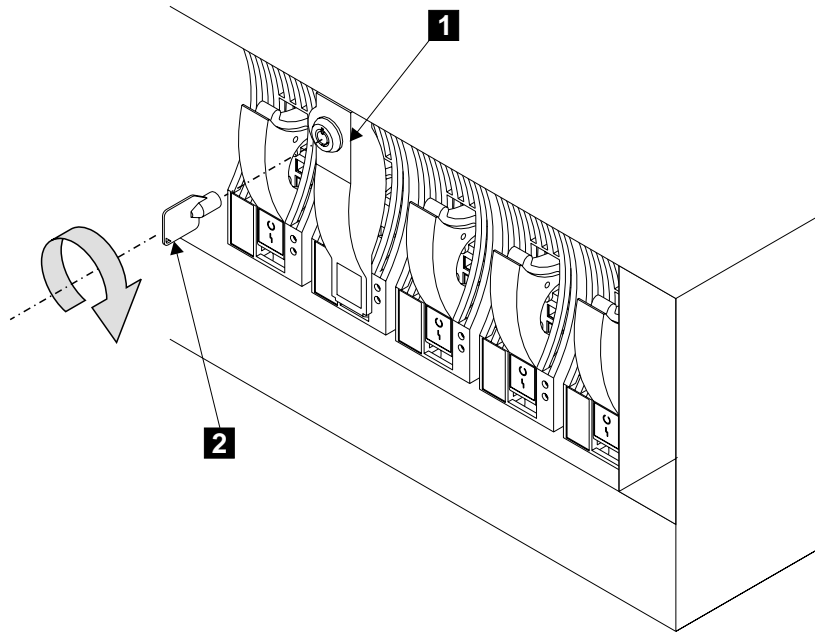


Figure 93. Installing the Lock onto a Dummy Disk Drive Module (1)

- Step 7. If the dummy disk drive module has a lock **1**, go to step 8.  
If the dummy disk drive module does not have a lock, go to step 12 on page 177.
- Step 8. Insert the flange **2** of the lock into the slot in the front of the dummy disk drive module.

Step 9. Refer to Figure 94.



*Figure 94. Installing the Lock onto a Dummy Disk Drive Module (2)*

Step 10. Push the lock **1** over the handle of the dummy disk drive module.

Step 11. Insert the key **2** into the lock, then turn the key clockwise. Return the key to the customer.

Step 12. Replace other parts in the reverse order.

---

## 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 95.

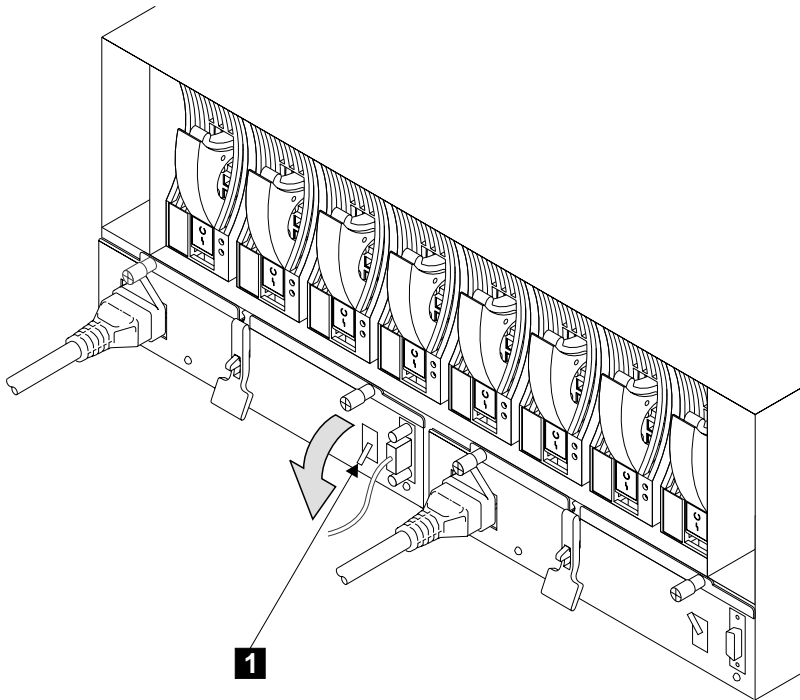


Figure 95. Switching Off a Power Supply Assembly

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 96.

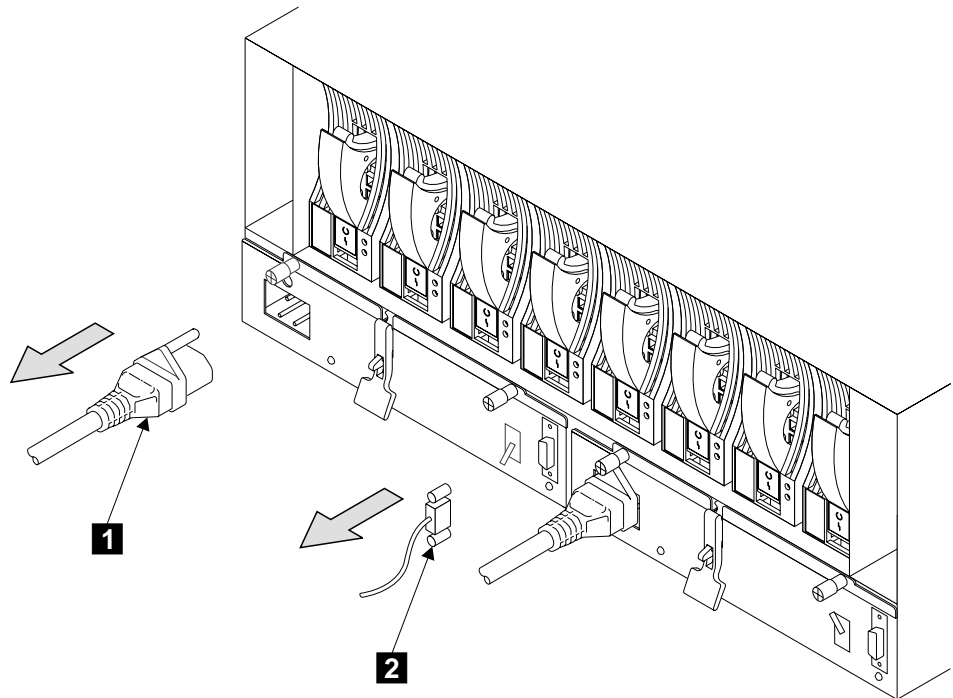


Figure 96. Removing the Power Cable and 7133 Power-Control Cable

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 97.

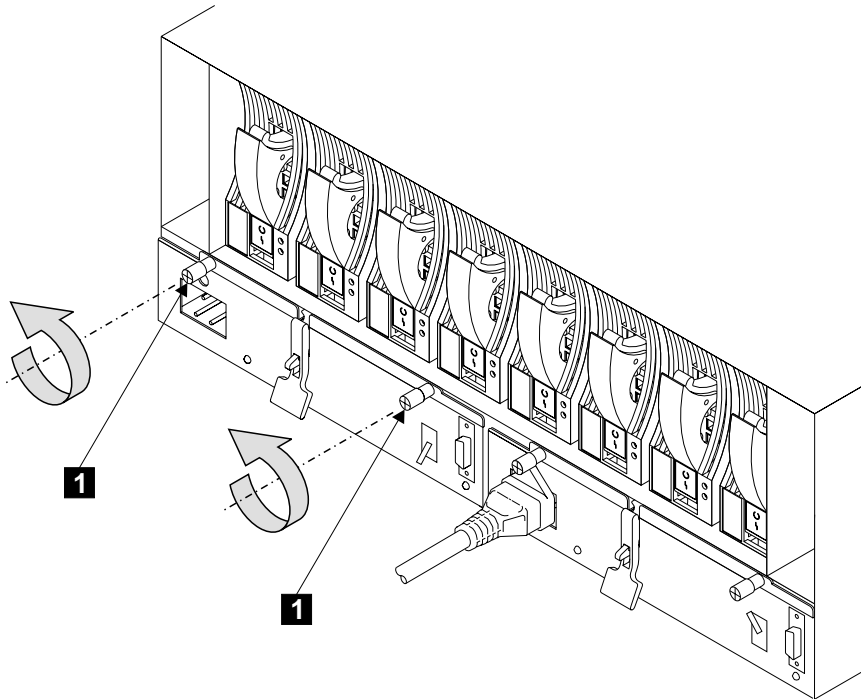
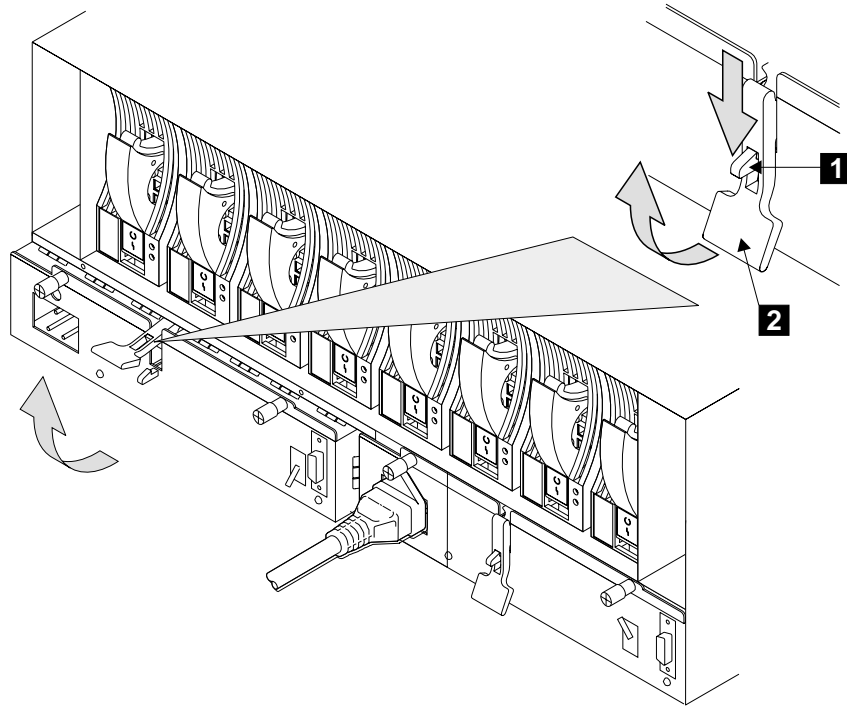


Figure 97. Unscrewing the Thumbscrews

Step 7. Unscrew the two thumbscrews **1** on the power supply assembly.

Step 8. Refer to Figure 98.



*Figure 98. 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 99.

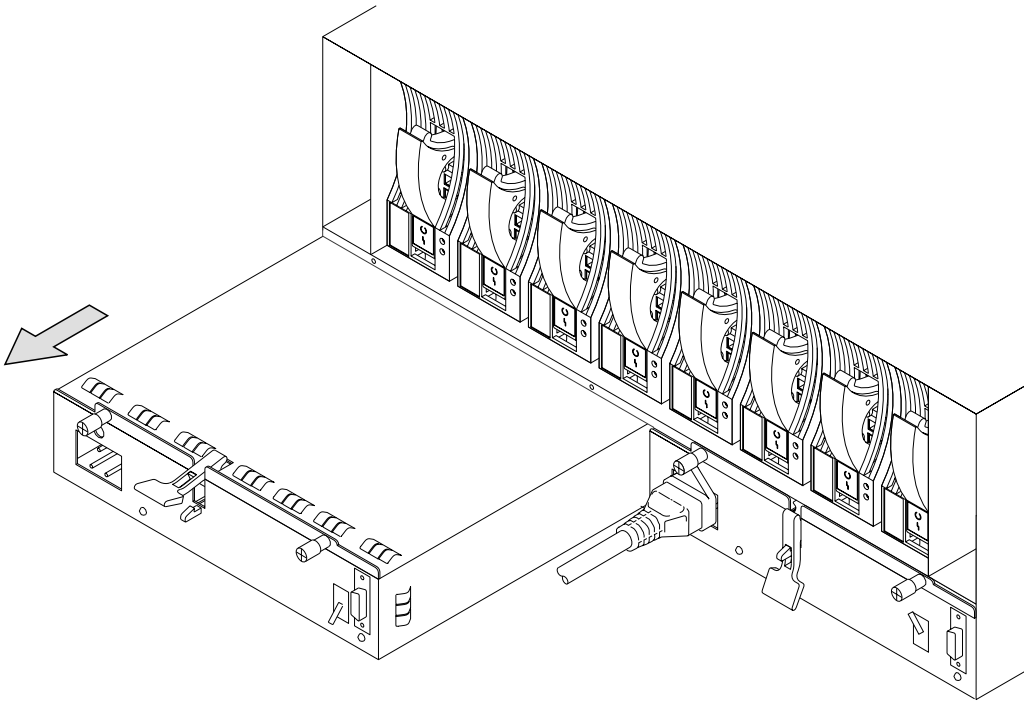


Figure 99. Removing the Power Supply Assembly

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 100.

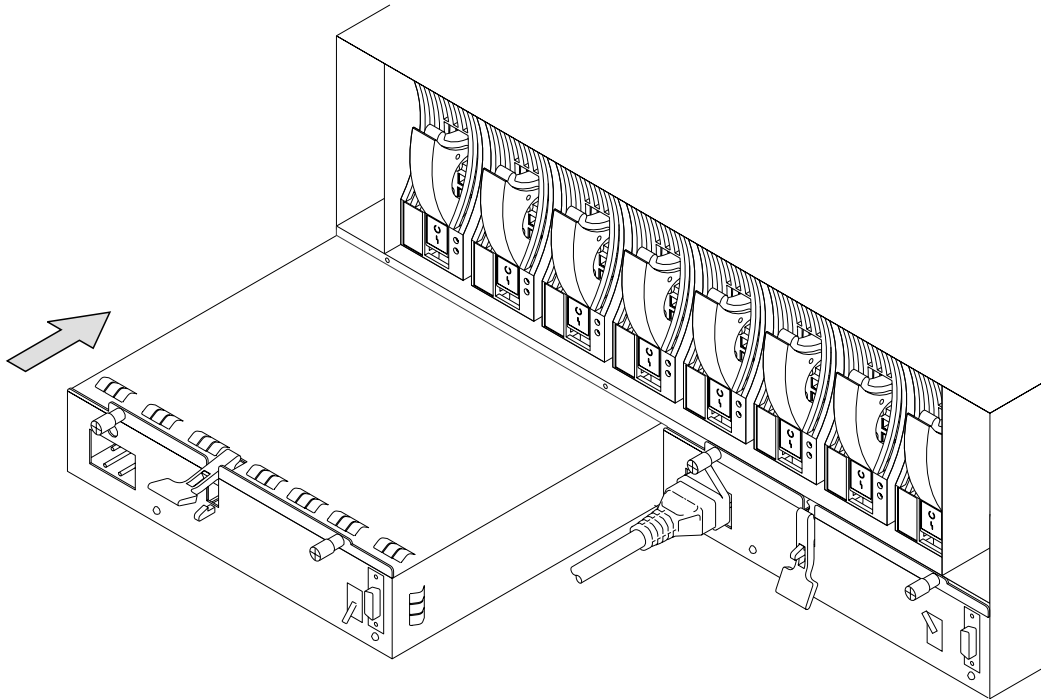


Figure 100. Inserting the Power Supply Assembly

Step 3. Push the power supply assembly into its housing. The assembly stops before it is fully home.

Step 4. Refer to Figure 101.

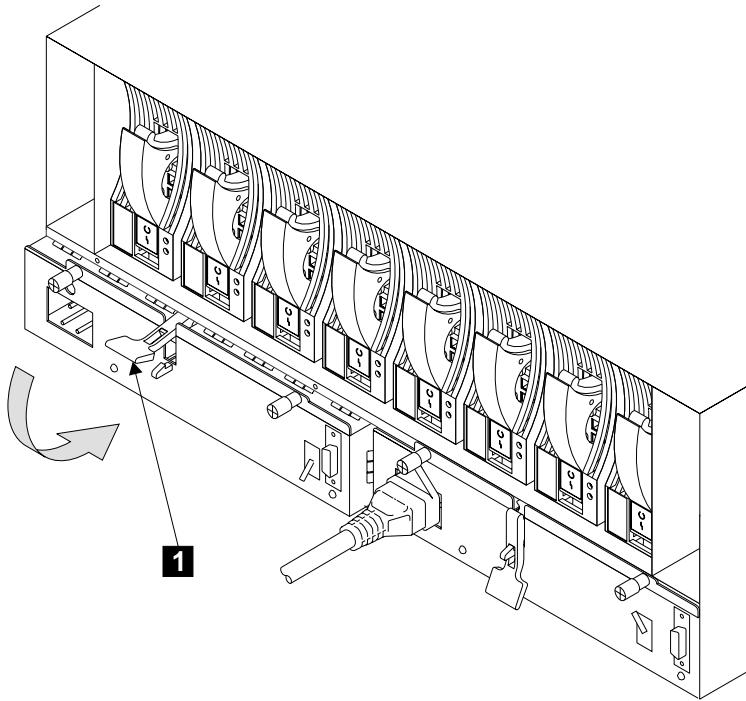


Figure 101. Pushing the Power Supply Assembly Fully Home

Step 5. Push the lever **1** fully downward. This action pushes the power supply assembly home

Step 6. Refer to Figure 102.

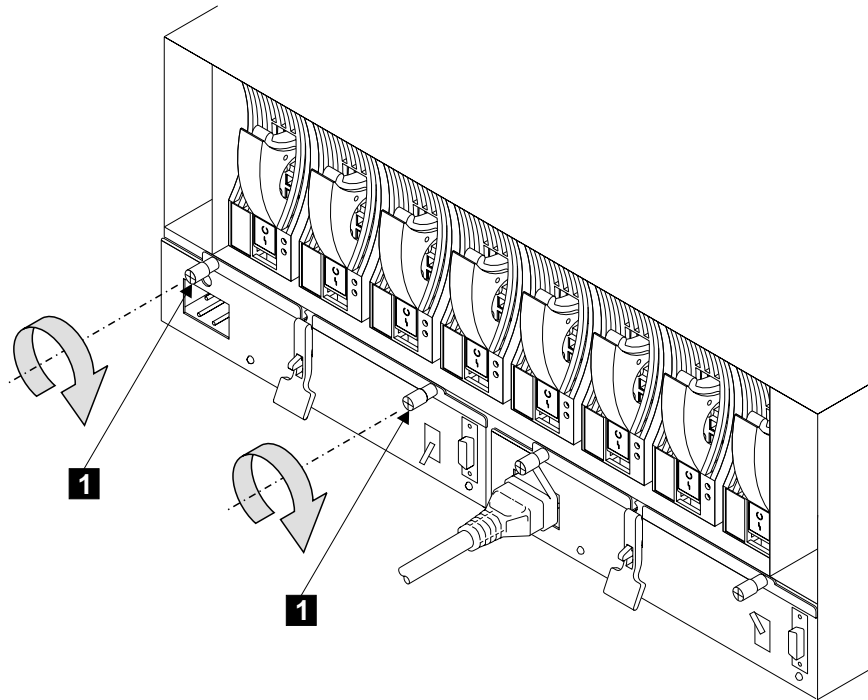


Figure 102. Tightening the Thumbscrews

Step 7. Tighten the thumbscrews **1**.

Step 8. Refer to Figure 103.

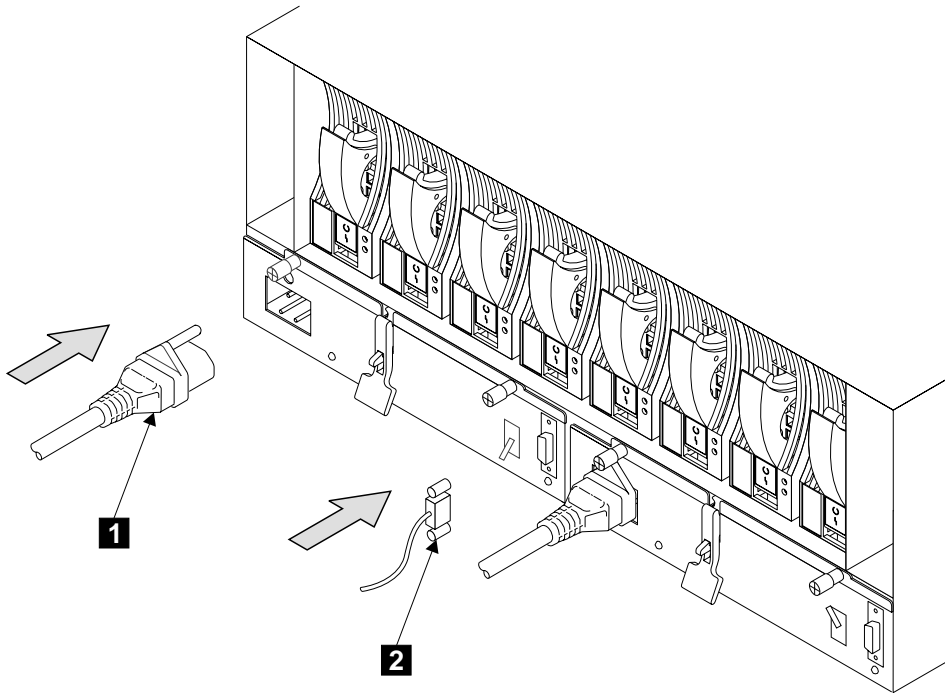


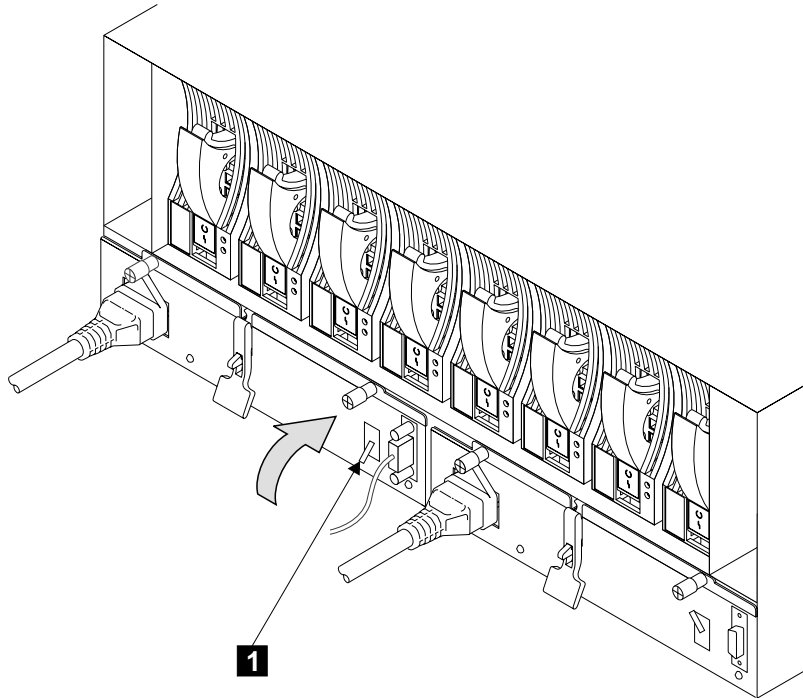
Figure 103. Installing the Cables

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 104.



*Figure 104. 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 139), 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 105.

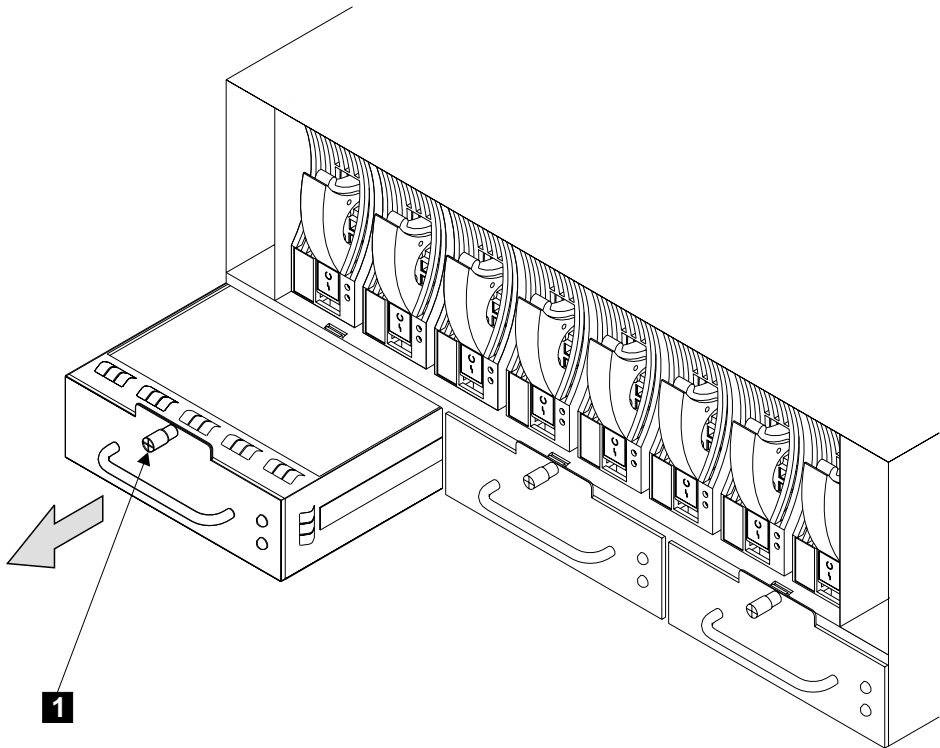


Figure 105. Removing a Fan Assembly

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 order.

**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).

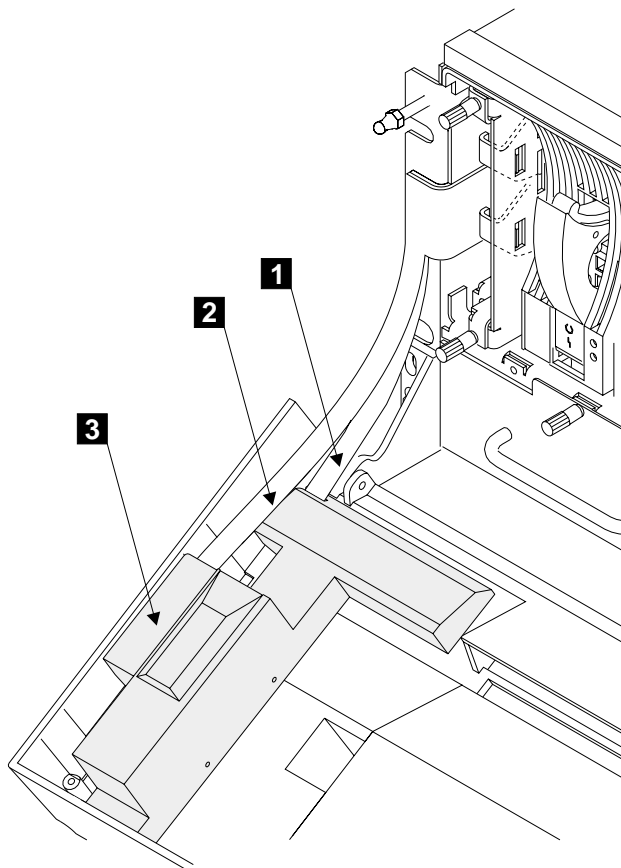
Go to the appropriate subsection.



## 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.

1. If not already done, open the front cover (see “Covers” on page 141).
2. Refer to Figure 106.



*Figure 106. Removing the ESD Cover from a Model D40*

3. Slide the electrostatic discharge (ESD) cover **3** forward until it disengages from the operator panel assembly.
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.
5. Carefully disengage the two flexible circuits from the slots in the ESD cover.
6. Remove the ESD cover.
7. Replace parts in the reverse order.

**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 141).

Step 2. Remove the ESD cover (see “ESD Cover (Model D40)” on page 191).

Step 3. Refer to Figure 107.

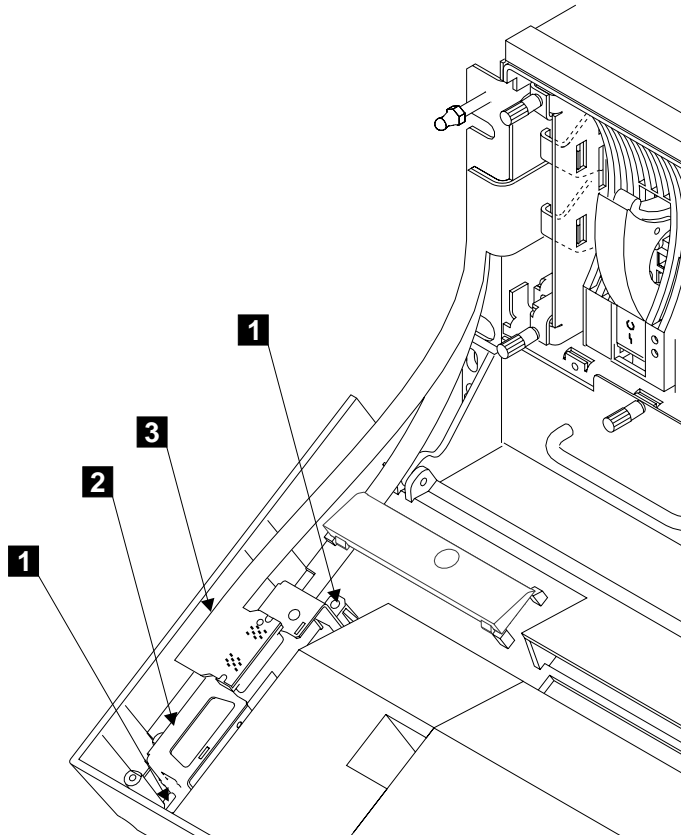


Figure 107. Removing the Operator Panel from a Model D40

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 order.

## 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 141).

Step 2. Remove the ESD cover (see “ESD Cover (Model D40)” on page 191).

Step 3. Refer to Figure 108.

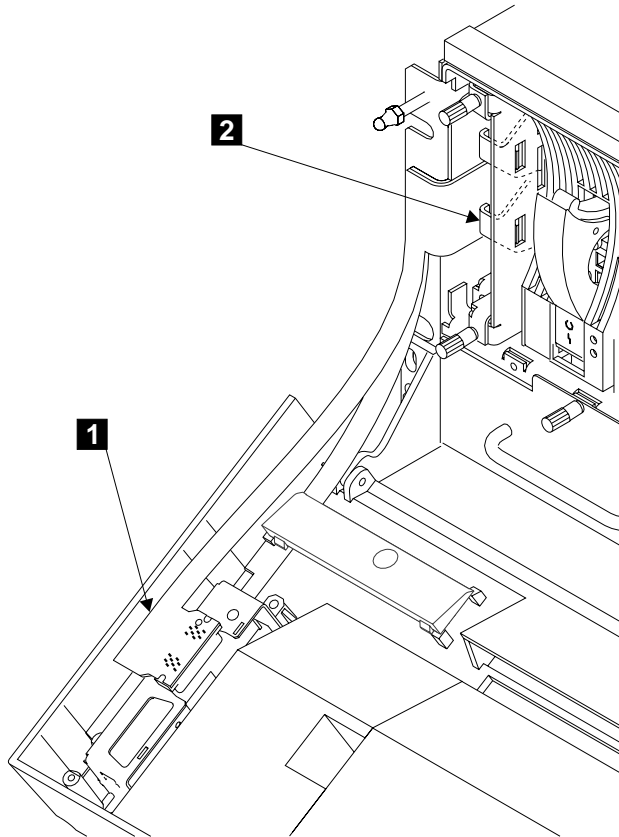


Figure 108. Removing the Operator Panel Flexible Circuit from a Model D40

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. 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. Replace parts in the reverse order.

**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 141).
- Step 2. Remove the ESD cover (see “ESD Cover (Model D40)” on page 191).
- Step 3. Refer to Figure 109.

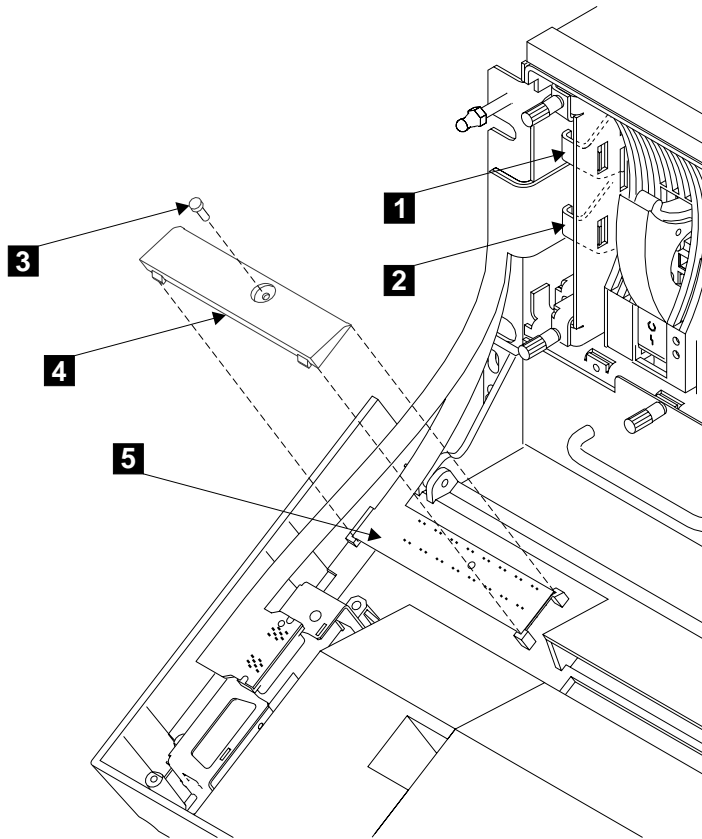


Figure 109. Removing the Disk Drive Status Lights Assembly from a Model D40

- Step 4. 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 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 screw **3**.

Step 7. Remove the LED-cable cover **4** and the disk drive status lights assembly **5**.

Step 8. Replace parts in the reverse order.

**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 back cover (see “Covers” on page 141).
- Step 3. Remove all power from the 7133 (see “Power (Model T40)” on page 149).
- Step 4. Refer to Figure 110.

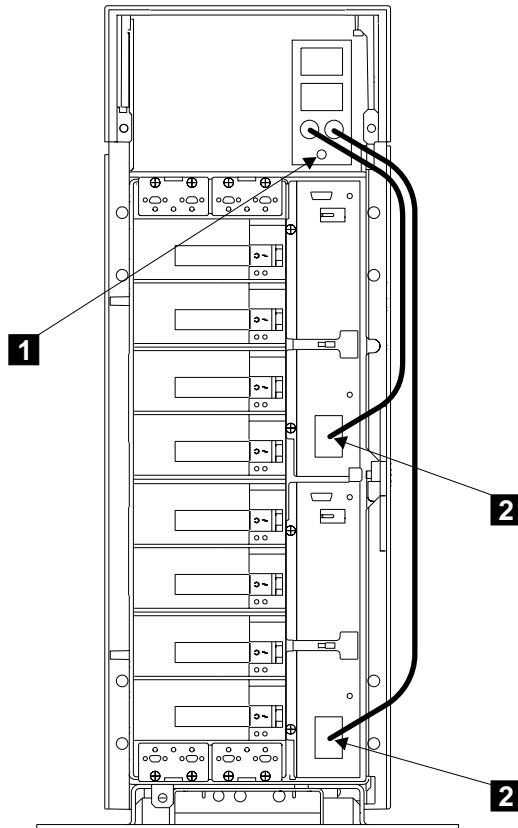


Figure 110. Removing the AC Connector Block

- Step 5. Unplug the two power cables **2** from the power supply assemblies.
- Step 6. Remove the screw **1** from the AC connector block.
- Step 7. Lift the AC connector block and turn it counterclockwise to remove it from its mounting lug.
- Step 8. Place the AC connector block and its attached power cables onto the flat surface inside the 7133.
- Step 9. Go to the front of the 7133.
- Step 10. If not already done, open the front cover (see “Covers” on page 141).

Step 11. Refer to 111.

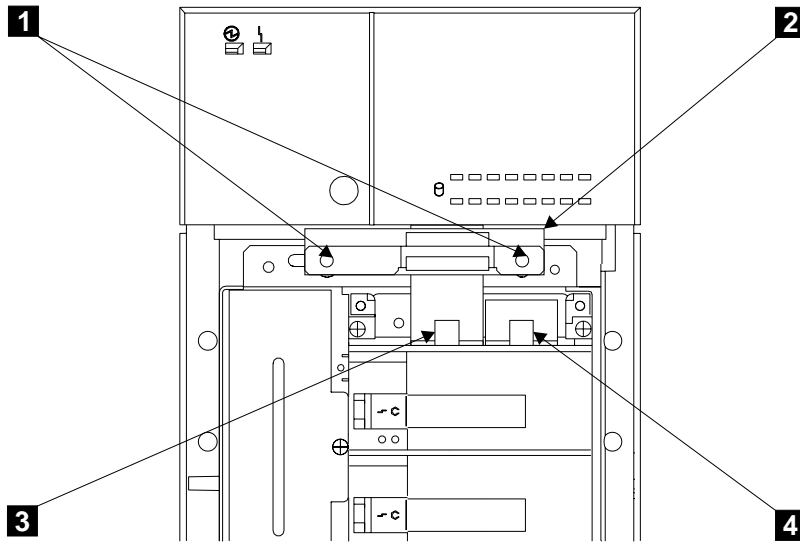


Figure 111. Disconnecting the Flexible Circuits

- Step 12. Remove the two front mounting screws **1** and the RFI bracket **2**.
- Step 13. Move the latch **3** upward, then pull it forward to unplug the operator panel flexible circuit from the controller card assembly.
- Step 14. Do the same actions with the latch **4** to unplug the disk drive status lights flexible circuit from the controller card assembly.

Step 15. Refer to Figure 112.

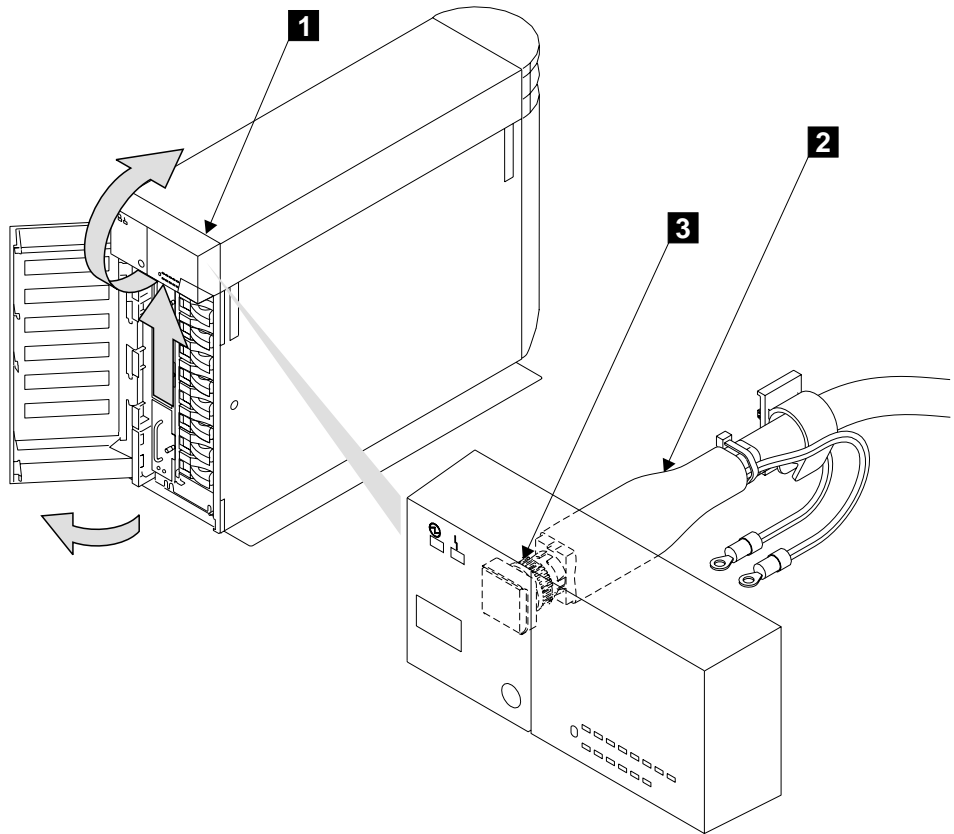


Figure 112. Removing the Front Bezel Assembly

- Step 16. Close the operator panel flap (if open) to prevent it from becoming damaged.
- Step 17. Holding the bezel assembly **1** with both hands, press its bottom surface upward to release its clips.
- Step 18. 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 19. **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.
- Step 20. Disconnect the power cable assembly **2** by pulling it away from the power switch assembly **3**.
- Step 21. Remove the bezel assembly.
- Step 22. Replace parts in the reverse order.

**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 141).

Step 2. Remove the front bezel assembly (see “Front Bezel Assembly (Model T40)” on page 199).

Step 3. Refer to Figure 113.

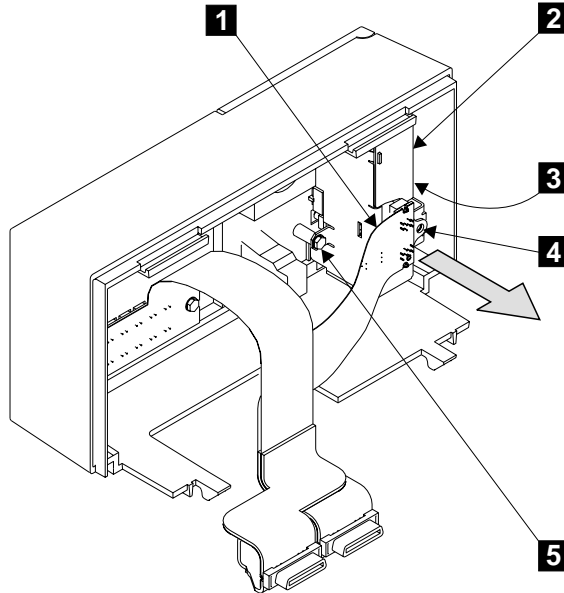


Figure 113. Removing the Operator Panel Flexible Circuit and the Operator Panel from a Model T40

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 order.

**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 141).
- Step 2. Remove the front bezel assembly (see “Front Bezel Assembly (Model T40)” on page 199).
- Step 3. Refer to Figure 114.

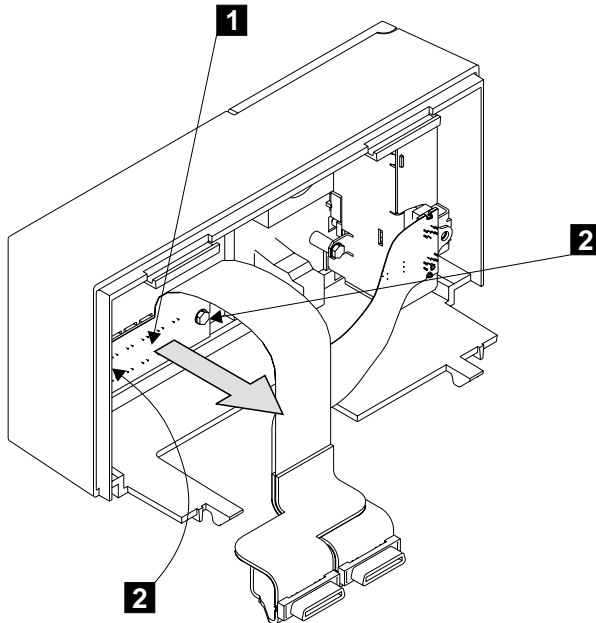


Figure 114. Removing the Disk Drive Status Lights Assembly from a Model T40

- Step 4. Unscrew the screws **2**.
- Step 5. Remove the disk drive status lights assembly **1**.
- Step 6. Replace parts in the reverse order.

**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 141).
- Step 2. Remove the front bezel assembly (see “Front Bezel Assembly (Model T40)” on page 199).
- Step 3. Refer to Figure 115.

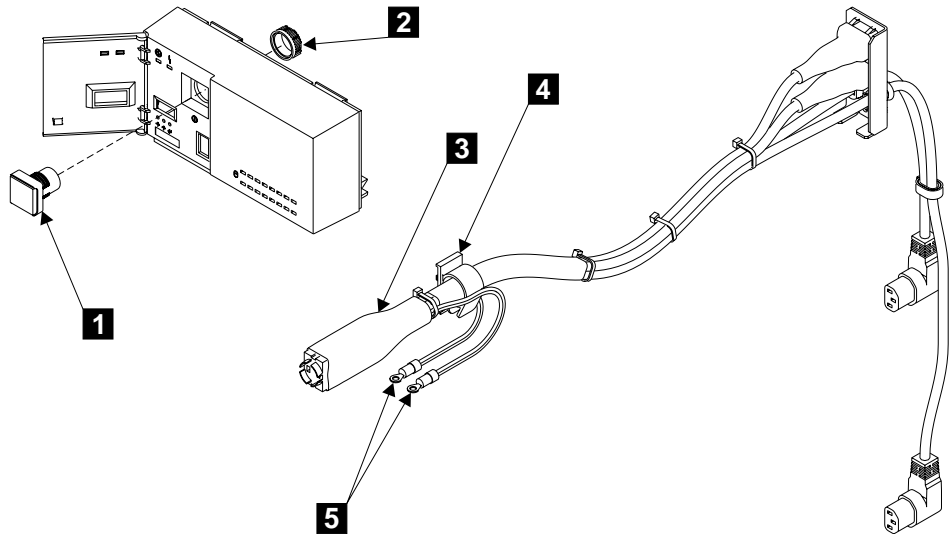


Figure 115. Removing the Power Cable Assembly

- Step 4. Remove the two nuts **5** to release the grounding wires.
- Step 5. Release the cable from the clip **4**.
- Step 6. Pull the power cable assembly **3** out through the front of the 7133.
- Step 7. Open the operator panel flap on the front bezel assembly.
- Step 8. Unscrew the retaining ring **2**. Be careful that you do not damage the flexible circuits that are inside the bezel assembly.
- Step 9. Remove the power switch assembly **1** from the bezel assembly.
- Step 10. Replace parts in the reverse order.

### Notes:

- When installing the new power switch assembly, ensure that the orientation mark on the top of the assembly is aligned with the notch in the face of the bezel assembly.
- 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.

- c. 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.



---

## 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 141).

Step 2. Refer to Figure 116

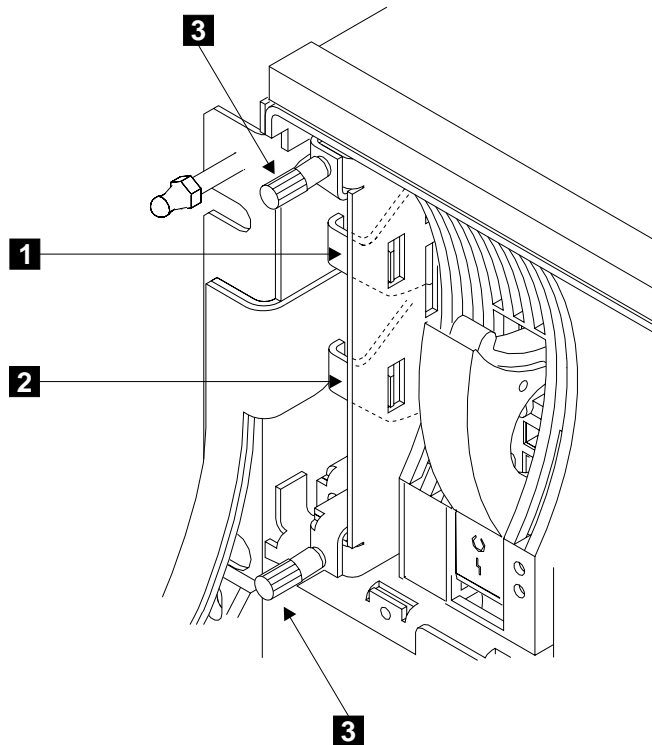


Figure 116. Removing the Controller Card Assembly

Step 3. 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 4. Do the same actions with the latch **1** to unplug the disk drive status lights flexible circuit from the controller card assembly.
- Step 5. Unscrew the two thumbscrews **3**.
- Step 6. 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 7. Replace parts in the reverse order.

**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 8. **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 117.

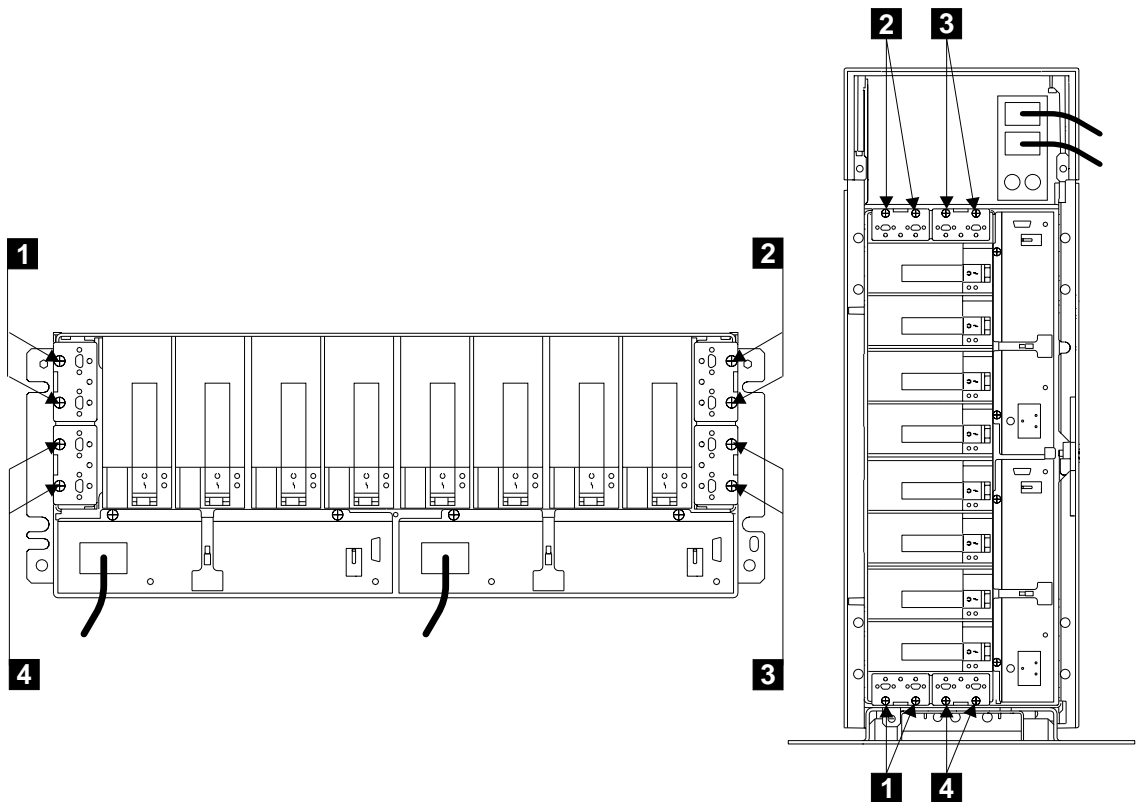


Figure 117. Removing the Bypass Cards

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 211.
- Step 8. Refer to 118.

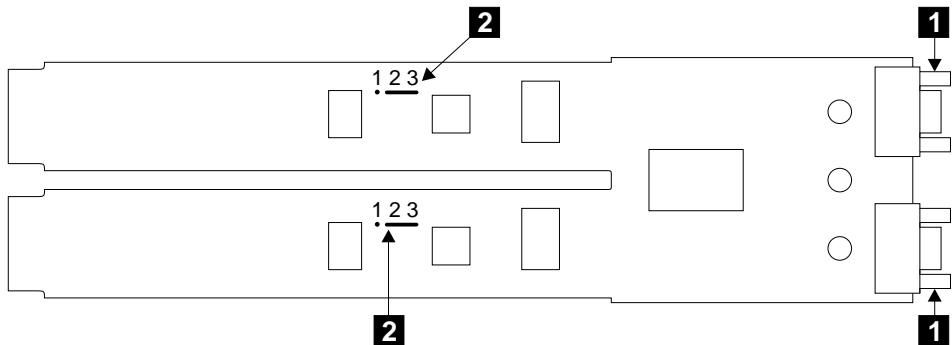


Figure 118. Jumpers Set for Automatic Mode

- 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 118, 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 119 on page 211, 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.

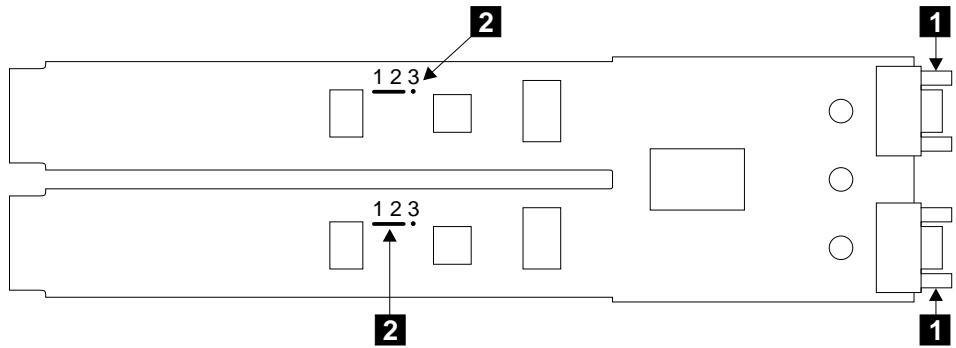


Figure 119. Jumpers Set for Forced Inline Mode

- 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 order. 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 120.

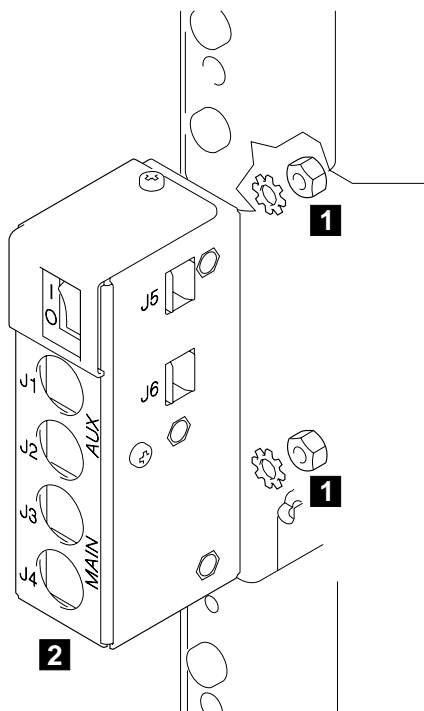


Figure 120. Removing the Remote-Power-On Control Unit from Model D40

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 order.

**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 145).

Step 2. Refer to Figure 121.

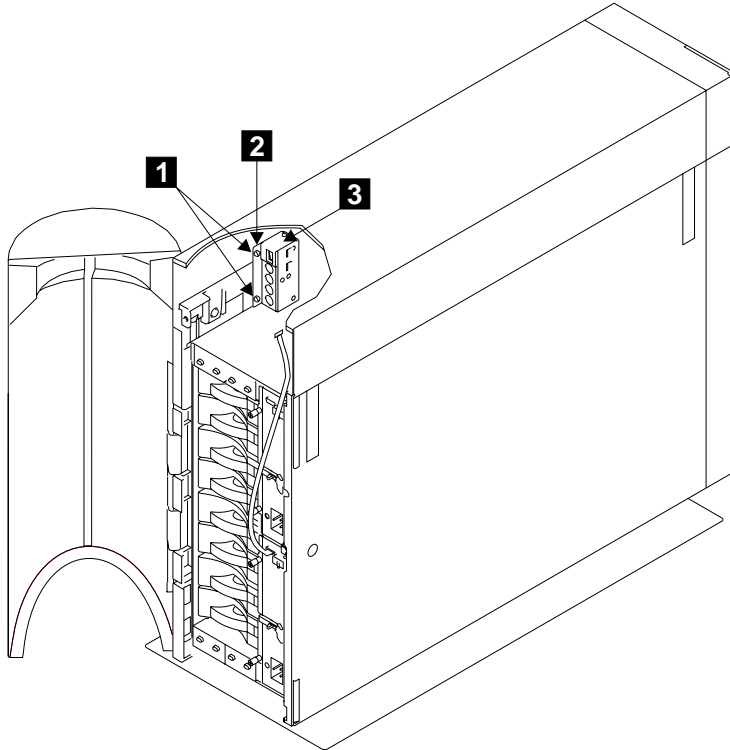


Figure 121. Removing the Remote-Power-On Control Unit from Model T40

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 122.

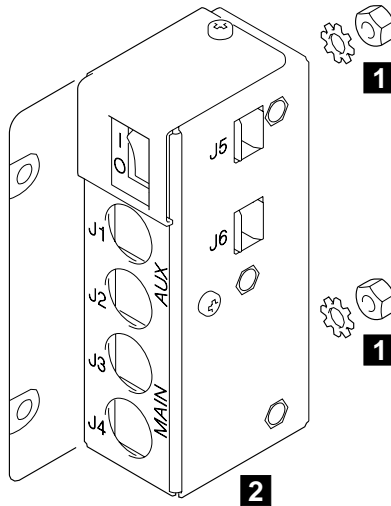


Figure 122. Removing the Remote-Power-On Control Unit from its Bracket

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 order.

**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 227.
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 146).
- Step 4. For Model D40, remove the front cover (see “Covers” on page 141).  
For Model T40, open the front cover (see “Covers” on page 141).
- Step 5. For Model T40, open the back cover (see “Back Cover (Model T40)” on page 145).
- 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 151).
- Step 8. Remove the three fan assemblies from the front of the 7133 (see “Fan Assemblies” on page 188).
- Step 9. Remove the controller card assembly (see “Controller Card Assembly” on page 207).
- Step 10. Remove the two power supply assemblies from the back of the 7133 (see “Power Supply Assemblies” on page 178).
- 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 209).
- 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 218.  
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 221.  
If you are removing the frame assembly of a Model T40, go to “Model T40” on page 224.

## Model D40 in an RS/6000 Rack

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

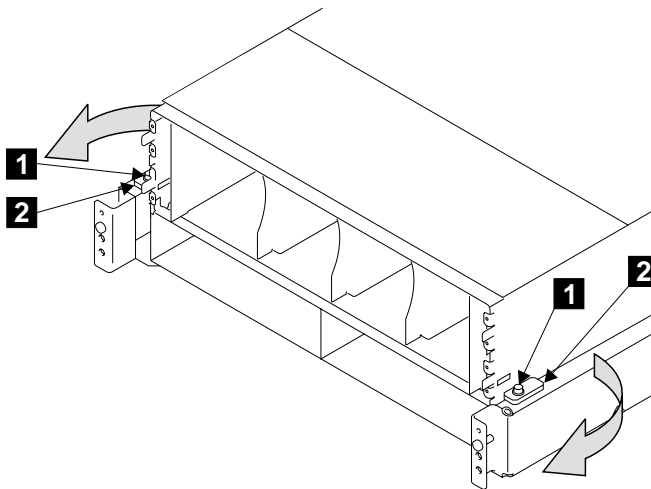


Figure 123. Moving the Clamp Plates

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

3. Refer to Figure 124

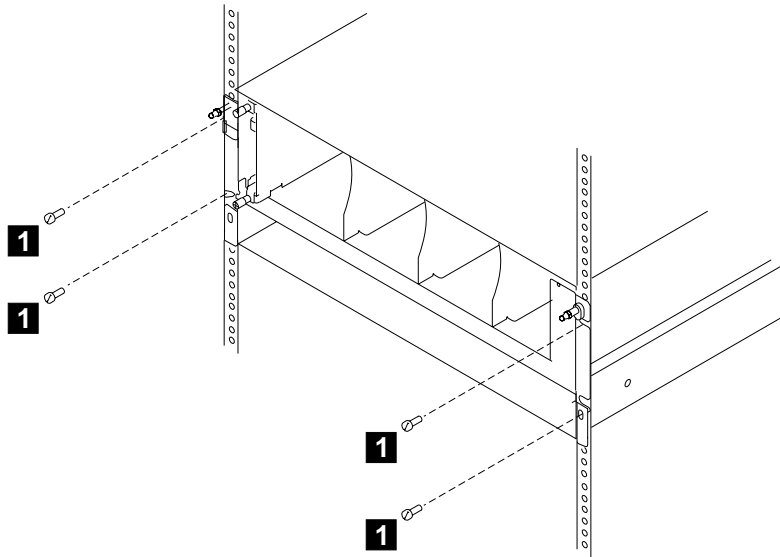


Figure 124. Removing the Frame Assembly from the RS/6000 Rack

4. Remove the four screws **1** from the front of the frame assembly.
5. **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.

6. Replace parts in the reverse order.

**Notes:**

- a. When you install the frame assembly into the rack, reinstall the front mounting screws and the back clamp plates in the following sequence:
  - 1) Install the lower left-hand front mounting screw. This screw locates the 7133 laterally. Do not fully tighten the screw yet.
  - 2) Install the other three front mounting screws. Do not fully tighten the screws yet.
  - 3) Fully tighten the lower left-hand front mounting screw.
  - 4) Fully tighten the other three front mounting screws.
  - 5) At the back of the 7133, reinstall the back clamp plates and tighten their screws.
- b. When you reinstall the external SSA cables, 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 37).
- d. Write the serial number of the original frame assembly onto the blank label.
- e. Destroy the serial number on the original frame assembly.

## Model D40 in a Netfinity Rack

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 125.

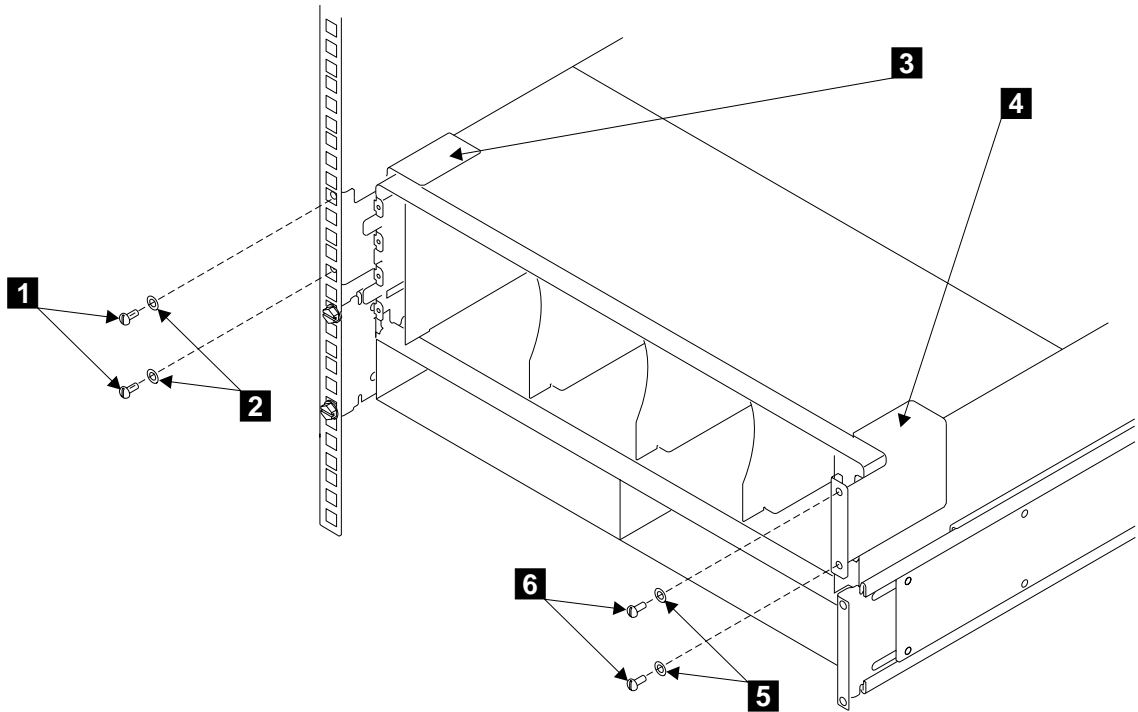


Figure 125. Removing the Back Brackets

2. At the back of the rack, remove the screws **1** and **6** and the washers **2** and **5**.
3. Remove the two back brackets **3** and **4**.

4. Refer to Figure 126.

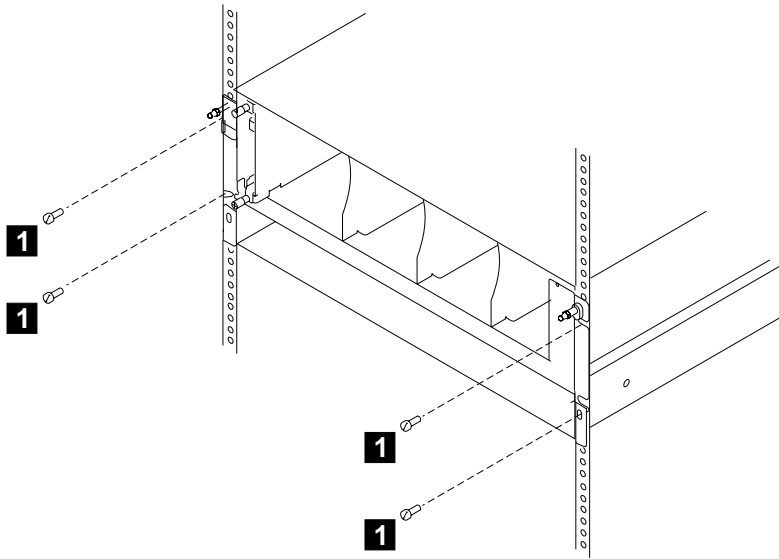


Figure 126. Removing the Front Screws

5. Remove the four front mounting screws **1**.
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.

7. Replace parts in the reverse order.

**Note:** When you reinstall the back brackets:

- a. Refer to Figure 125 on page 221.
- 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 37).
- 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

1. Remove the front bezel assembly (see “Front Bezel Assembly (Model T40)” on page 199).
2. Remove the power switch and cable assembly (see “Power Switch and Cable Assembly (Model T40)” on page 205).
3. Remove the remote-power-on control unit if present (see “Remote-Power-On Control Unit (Model T40)” on page 214).
4. Refer to Figure 127.

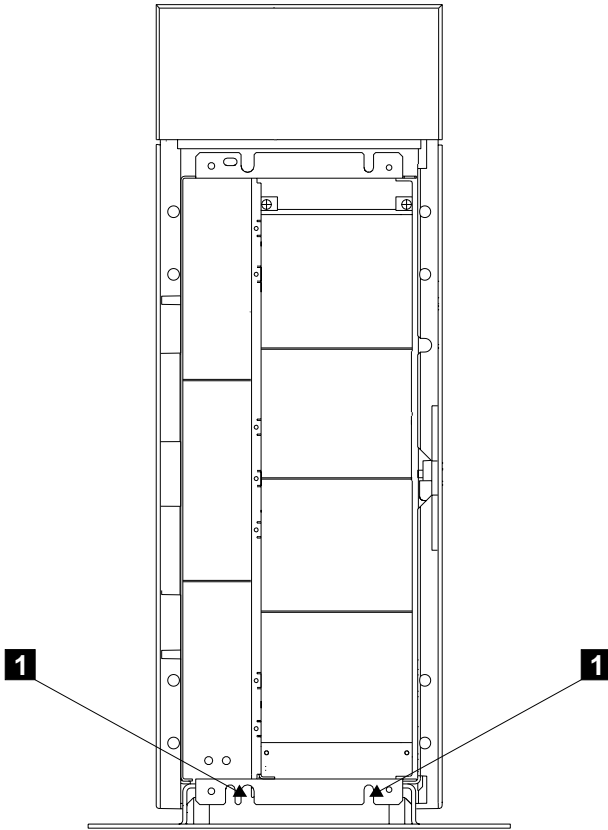


Figure 127. Removing the Frame from a Model T40 (1)

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.)

6. Refer to Figure 128.

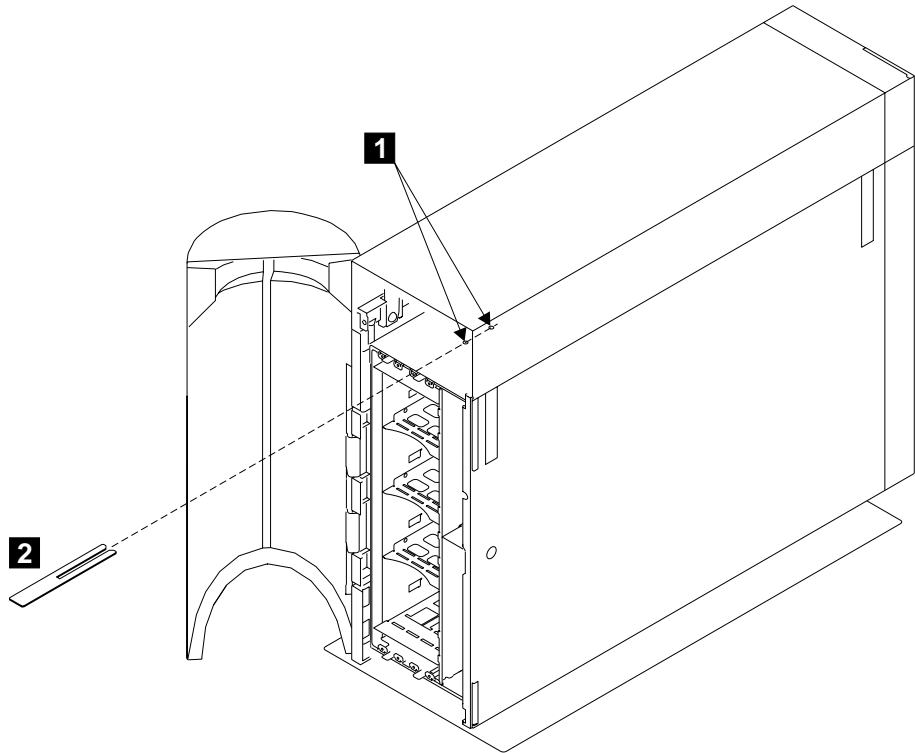


Figure 128. Removing the Frame from a Model T40 (2)

7. At the back of the 7133, remove the two screws **1**.
8. Remove the equivalent two screws from the bottom of the frame assembly.
9. Pull out the shim **2**.
10. Go to the front of the 7133.
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.

12. Replace parts in the reverse order.

**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 199).
- 2) Ensure that you reinstall the shim. This shim ensures that the covers do not become distorted when all the screws are tightened. At the back of the 7133:
    - a) Install the two screws ( **1** in Figure 128), 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 37).
  - 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 216.
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 146).
- f. Open the front cover (see “Covers” on page 141).

- 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 50.0 kg (110 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” on page 151).

- 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 229.

If you are removing the Model D40 from a Netfinity rack, go to “Model D40 in a Netfinity Rack” on page 232.

## Model D40 in an RS/6000 Rack

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 129.

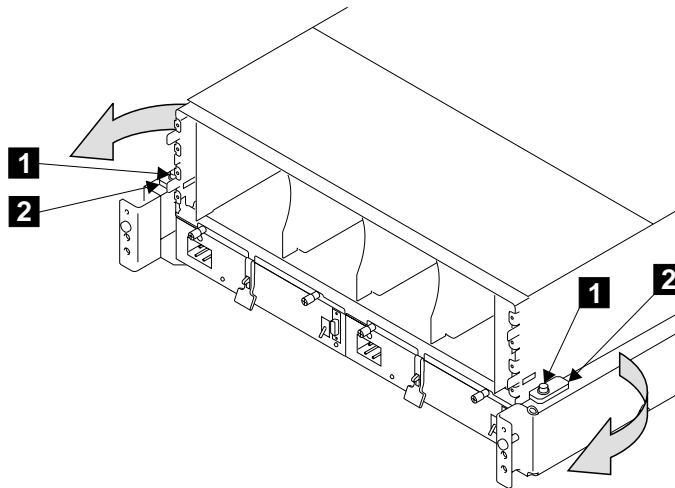


Figure 129. Moving the Clamp Plates

2. Loosen the two screws **1**, and pivot the two clamp plates **2** away from the slots in the 7133.

3. Refer to Figure 130.

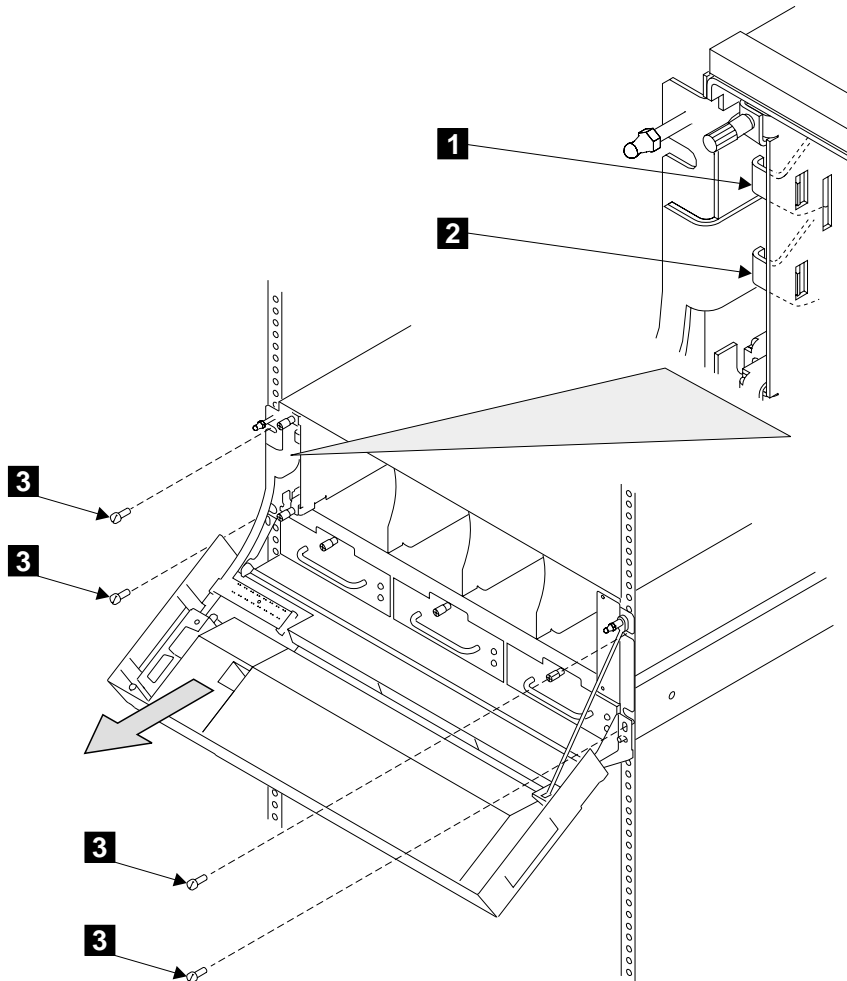


Figure 130. Removing a Model D40 from an RS/6000 Rack

4. **Attention:** To prevent damage to the flexible circuits, disconnect them before you install the front mounting screws.  
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.
5. Do the same actions with the latch **1** to unplug the disk drive status lights flexible circuit from the controller card assembly.
6. Remove the four mounting screws **3**.



7. **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.

8. Reinstall the 7133 in the reverse order.

**Notes:**

- a. When you reinstall the frame assembly into the rack, reinstall the front mounting screws and the back clamp plates in the following sequence:
  - 1) Install lower left-hand front mounting screw. This screw locates the 7133 laterally. Do not fully tighten the screw yet.
  - 2) Install the other three front mounting screws. Do not fully tighten the screws yet.
  - 3) Fully tighten the lower left-hand front mounting screw.
  - 4) Fully tighten the other three front mounting screws.
  - 5) At the back of the 7133, reinstall the back clamp plates and tighten their screws.
- b. When you reinstall the external SSA cables, ensure that you use the special screwdriver (SSA tool, part 32H7059) to tighten the SSA connector screws.

## Model D40 in a Netfinity Rack

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 131.

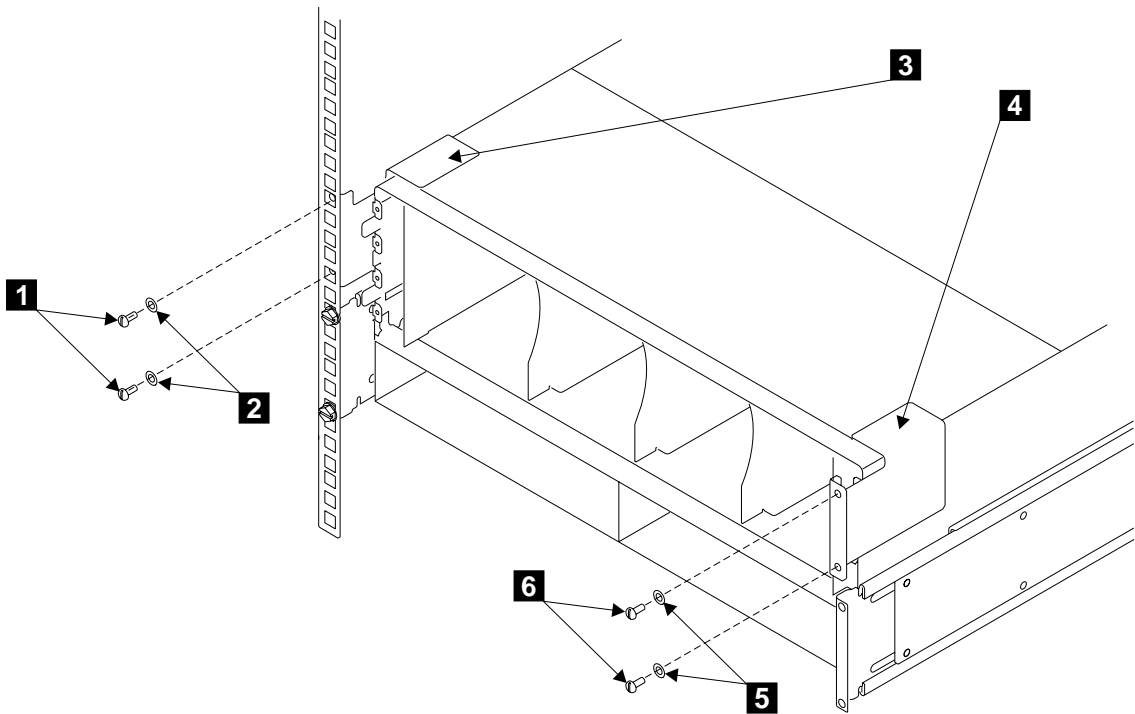


Figure 131. Removing the Back Brackets

2. At the back of the rack, remove the screws **1** and **6** and the washers **2** and **5**.
3. Remove the two back brackets **3** and **4**.

4. Refer to Figure 132.

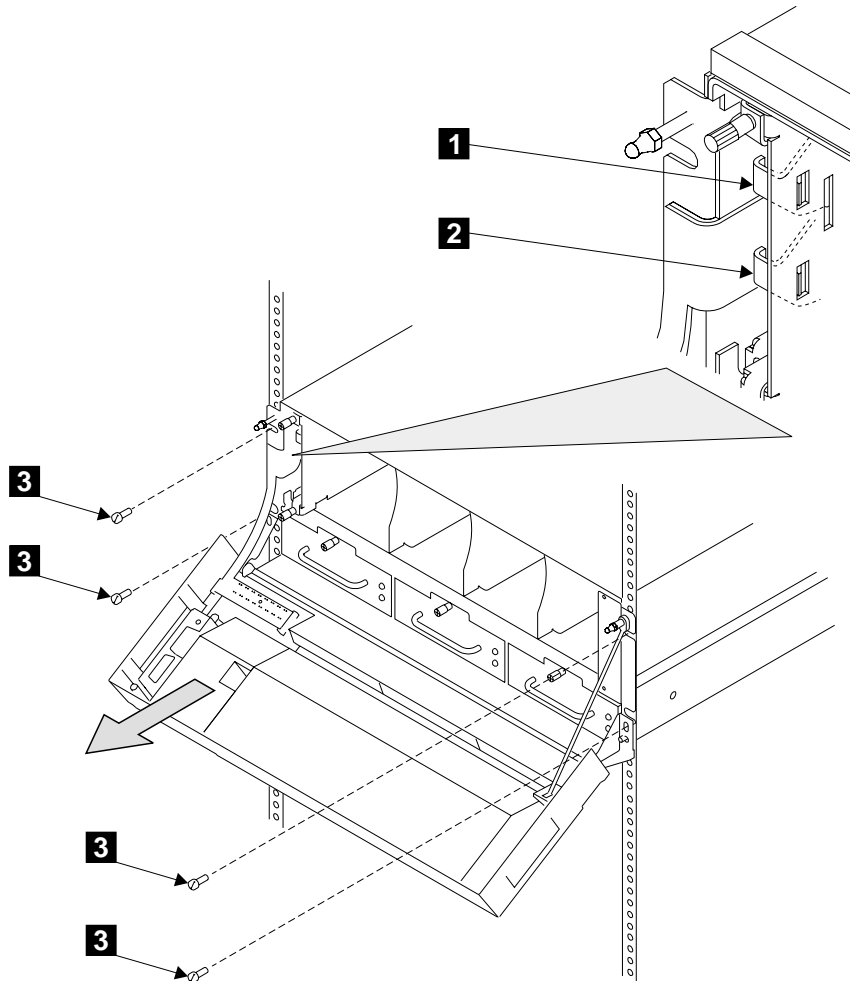


Figure 132. Removing the Front Screws

5. **Attention:** To prevent damage to the flexible circuits, disconnect them before you install the front mounting screws.  
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.
6. Do the same actions with the latch **1** to unplug the disk drive status lights flexible circuit from the controller card assembly.
7. Remove the four front mounting screws **3**.

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 frame assembly forward and remove it from the rack.

9. Replace parts in the reverse order.

**Note:** When you reinstall the back brackets:

- a. Refer to Figure 131 on page 232.
- 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**.

---

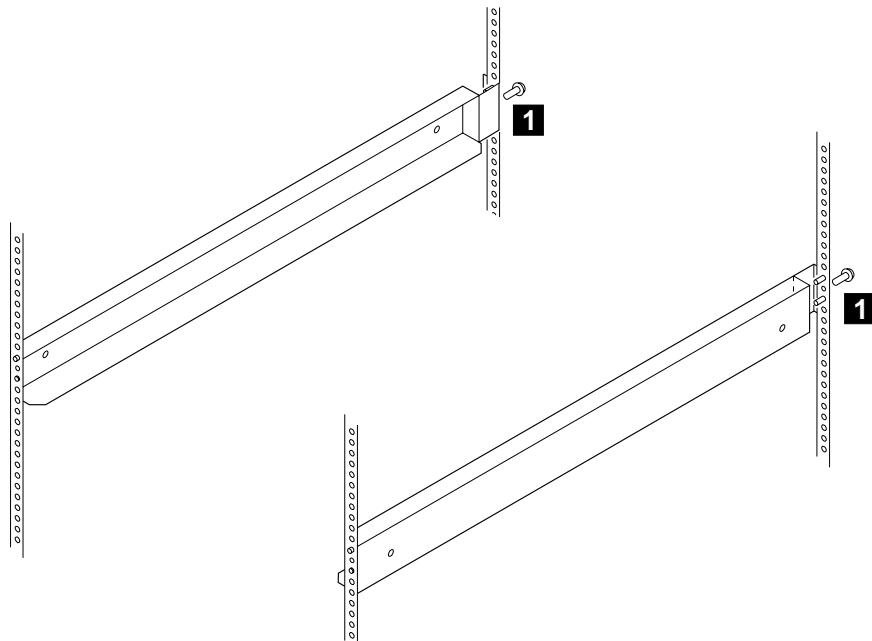
## Support Rails

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 238.

### RS/6000 Support Rails

Step 1. Refer to Figure 133.



*Figure 133. Removing the Support Rails from an RS/6000 Rack*

- Step 2. To remove the support rails, remove the screws **1**, then remove the rails.
- Step 3. 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 4.
- Step 4. The 7133 Model D40 is four EIA<sup>1</sup> 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 5. 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 6. For each support rail:  
a. Refer to Figure 134.

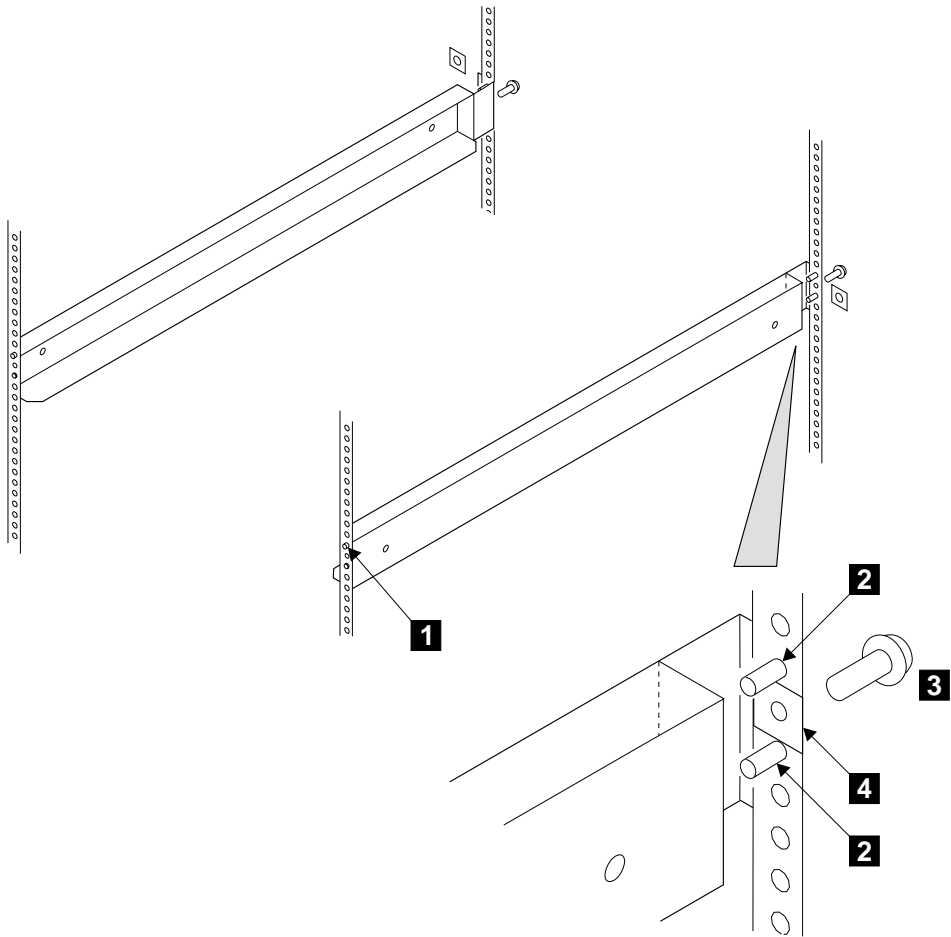


Figure 134. Installing the Support Rails into an RS/6000 Rack

- 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 6c.
- e. Insert the rail screw **3** into the nut clip **4**, and tighten it.

Step 7. Refer to Figure 135.

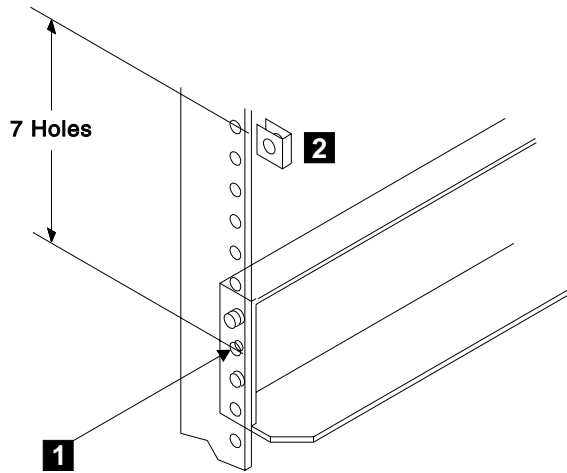


Figure 135. Installing the Nut Clips

Step 8. At the front of the rack, observe the threaded hole **1** in each of the support rails that you have just installed.

Step 9. Count seven holes upward from each threaded hole, and install a nut clip **2**.

## Netfinity Support Rails

Step 1. Refer to Figure 136.

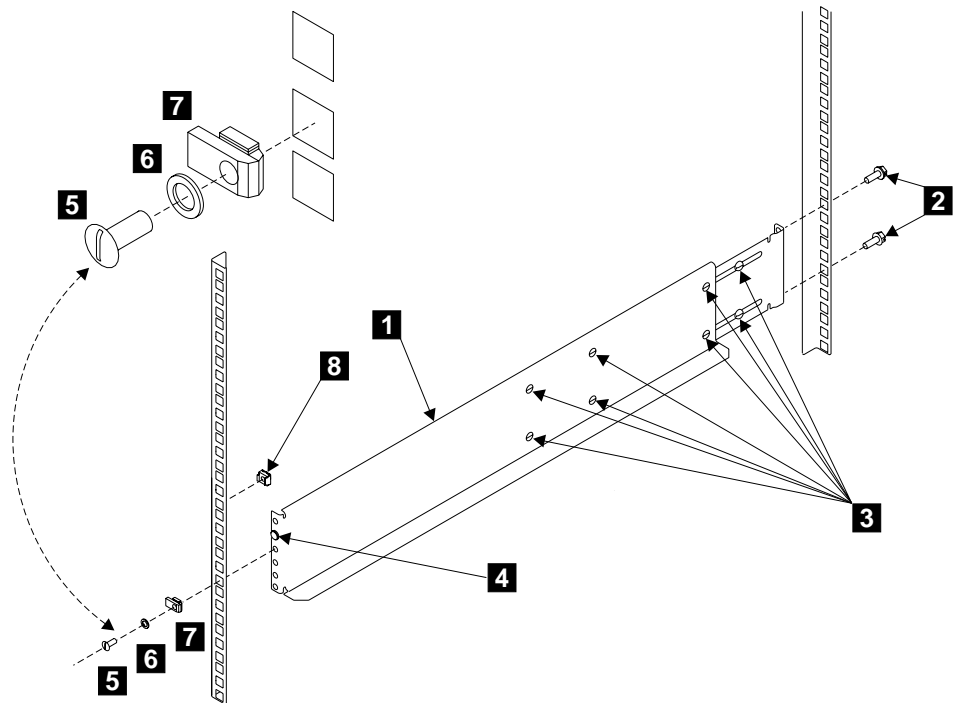


Figure 136. Removing Support Rails from a Netfinity Rack

- 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 137.

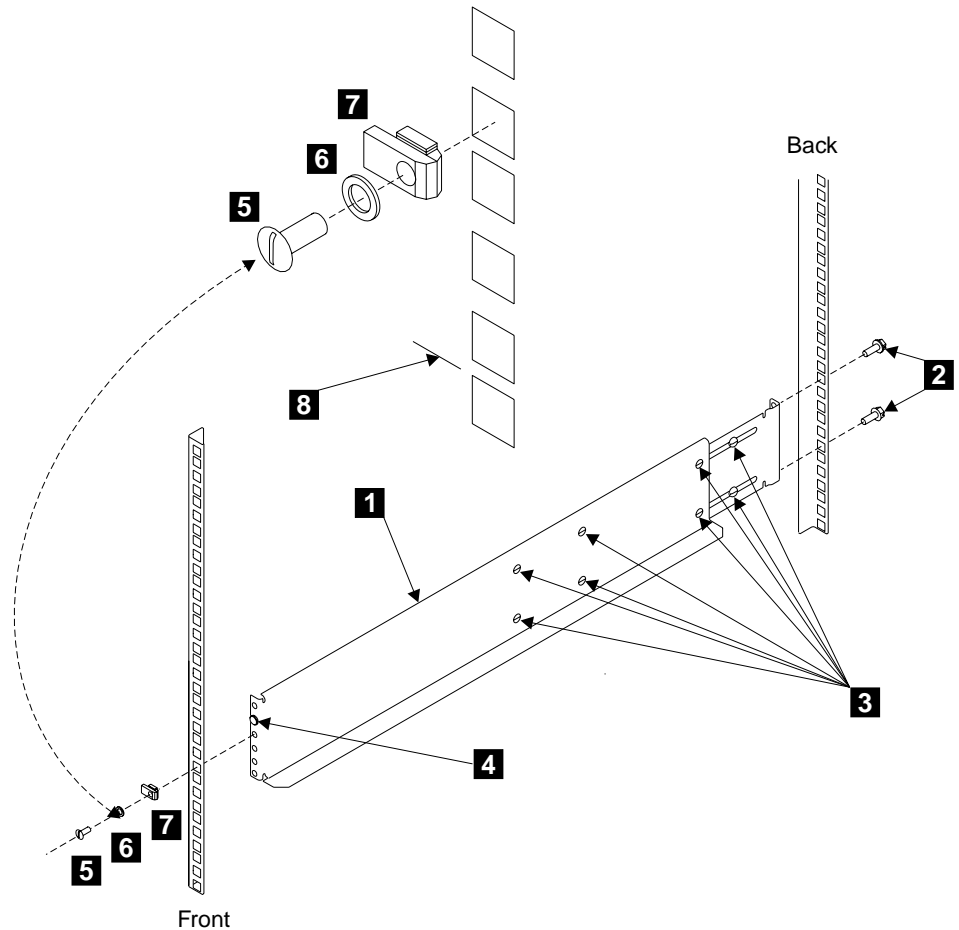


Figure 137. Installing Support Rails into a Netfinity Rack

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, re-engage 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, re-engage 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 138.

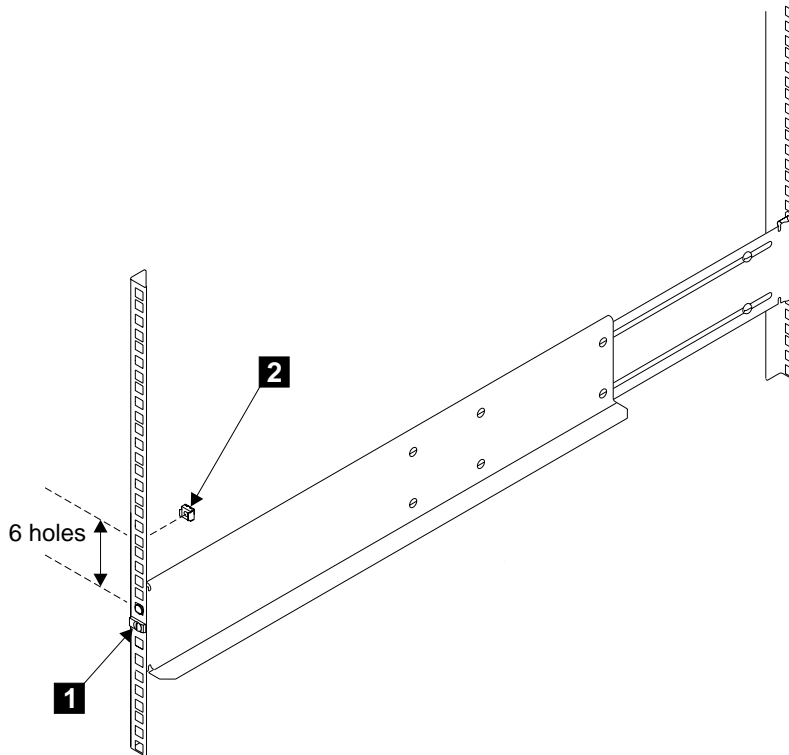


Figure 138. Installing the Nut Clips

- 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.

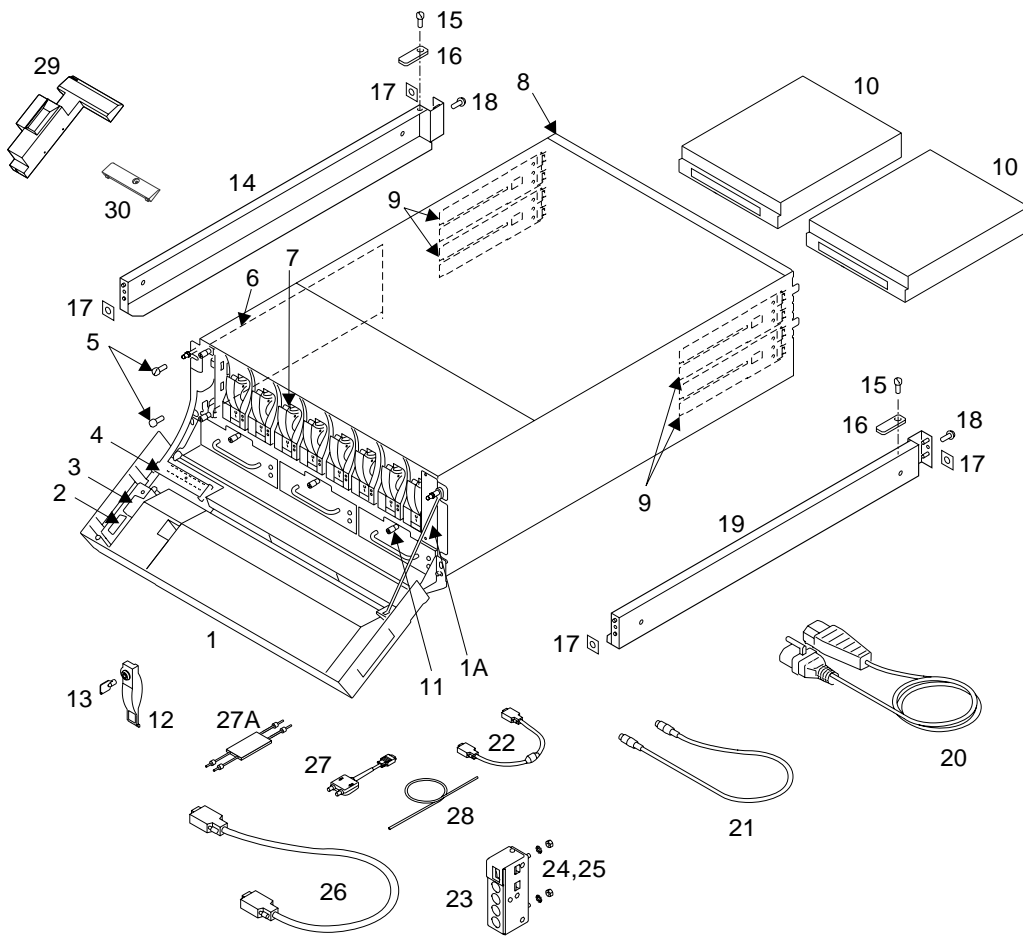
This parts catalog gives part numbers for the parts and FRUs of the 7133 Models D40 and T40.

---

### Conventions

**AR** in the units column of the parts list denotes that the quantity used is as required.

# 7133 Model D40

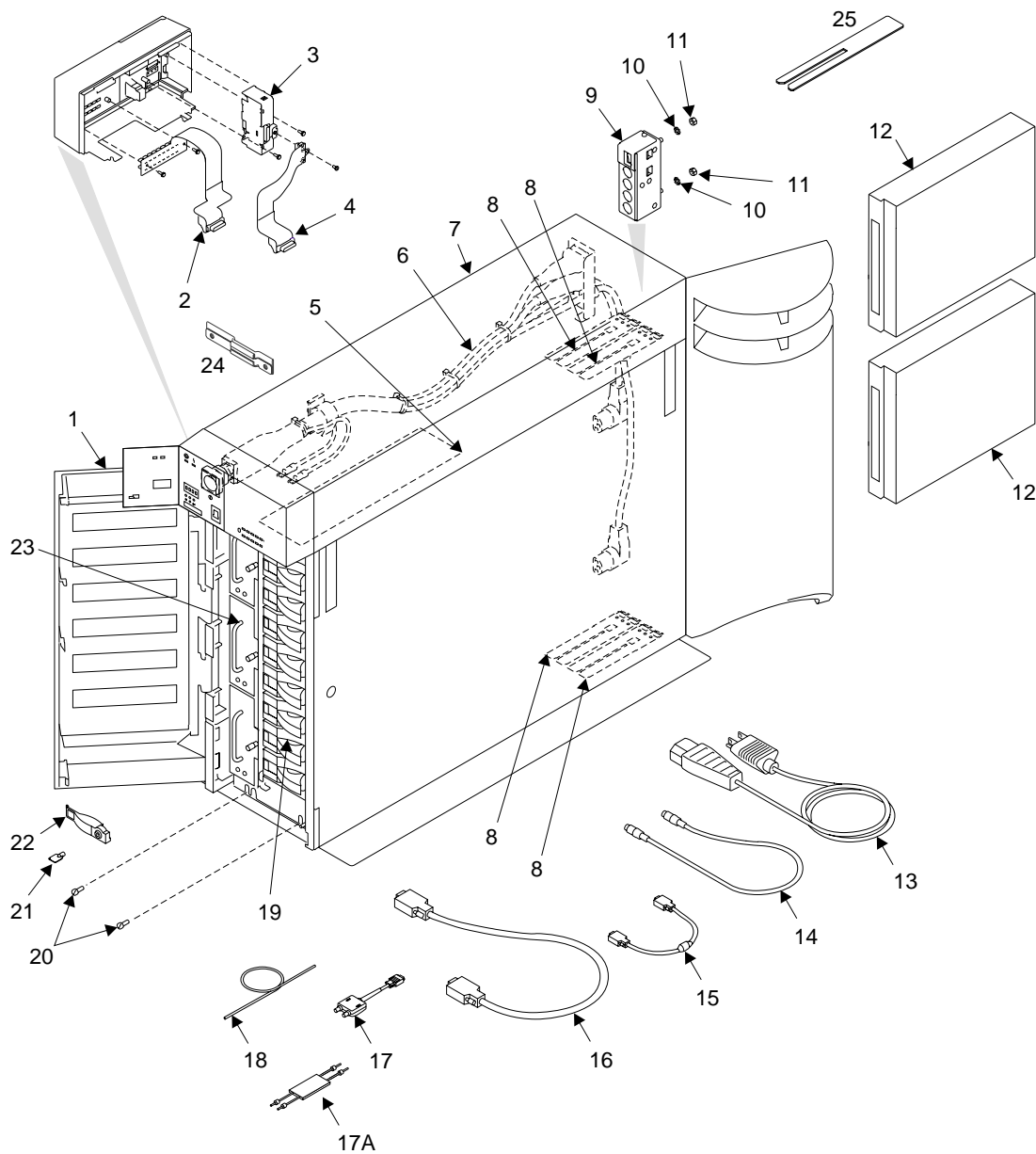


ASM-Index	Part Number	Units	Description
1-1	09L1686	1	Front cover assembly without operator panel and cables (white)
1-1	09L1687	1	Front cover assembly without operator panel and cables (black)
1A	08L7946	1	Strap
-2	08L7924	1	Operator panel assembly
-3	09L1677	1	Operator panel cable assembly
-4	09L1676	1	Disk drive status lights assembly
-5	77G0599	4	Front mounting screw
-6	09L2083	1	Controller card assembly
-7	09L1848	AR	4.5 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: 4 GB SSA C Physical Disk Drive)
-7	09L1847	AR	9.1 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: 9 GB SSA C Physical Disk Drive)
-7	34L6412	AR	9.1 GB, 3.5-inch, 10020 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: 18 GB SSA C Physical Disk Drive)
-7	34L6413	AR	18.2 GB, 3.5-inch, 10020 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
-7	34L6414	AR	36.4 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (36400 MB))
-7	05J8006	AR	Dummy disk drive module
-8	09L1850	1	Frame assembly (FRU kit, including foam baffle and labels)
-9	09L5510	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
-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
-16	51H8804	2	Back clamp plate
-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
-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
-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)

ASM-Index	Part Number	Units	Description
-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 Fibre-Optic Extender
- 29	09L1693	1	Cover, ESD
- 30	08L7906	1	Cover, LED cable



# 7133 Model T40



ASM-Index	Part Number	Units	Description
2-1	05J7956	1	Complete set of covers <b>Note:</b> Covers are available only as a complete set, which consists of: <ul style="list-style-type: none"> <li>• Front cover</li> <li>• Back cover</li> <li>• Front bezel</li> <li>• Top cover</li> <li>• Left-hand side cover</li> <li>• Right-hand side cover</li> <li>• Foot</li> </ul>
-2	05J7974	1	Disk drive status lights cable assembly
-3	08L7773	1	Operator panel assembly
-4	08L7774	1	Operator panel cable assembly
-5	09L2083	1	Controller card assembly
-6	09L1678	1	Power switch and cable assembly
-7	09L1850	1	Frame assembly (FRU kit, including foam baffle and labels)
-8	09L5510	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 250.
-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	Advanced SSA Optical Extender
-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 Fibre-Optic Extender
-19	09L1848	AR	4.5 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: 4 GB SSA C Physical Disk Drive)
-19	09L1847	AR	9.1 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: 9 GB SSA C Physical Disk Drive)
-19	34L6412	AR	9.1 GB, 3.5-inch, 10020 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: 18 GB SSA C Physical Disk Drive)
-19	34L6413	AR	18.2 GB, 3.5-inch, 10020 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (18200 MB))
-19	34L6414	AR	36.4 GB, 3.5-inch, 7200 rpm, SSA disk drive module (Name used by system: SSA160 Physical Disk Drive (36400 MB))
-19	05J8006	AR	Dummy disk drive module
-20	84X4760	8	Mounting screw

ASM-Index	Part Number	Units	Description
-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	1.8 m (6 ft)	76H4865
	125 V 15 A	4.3 m (14 ft)	12J5112
	250 V 15 A	2.7 m (9 ft)	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

Related Publications . . . . .	252
Web Support Pages. . . . .	252
Addressing SSA Disk Drives . . . . .	253
Location Code Format . . . . .	253
Pdisks, Hdisks, and Disk Drive Module Identification . . . . .	253
Software and Microcode Errors . . . . .	254
Controller Card Microcode Maintenance . . . . .	255
Downloading Disk Drive Microcode. . . . .	256
Diagnostics Information . . . . .	256
Concurrent Diagnostics . . . . .	256
Nonconcurrent Diagnostics . . . . .	256
Problems Corrected. . . . .	256
Displaying Link and Power Problems . . . . .	257
Service Aids . . . . .	259
Physical Link Configuration . . . . .	259
Keys to Use . . . . .	259
Legend for Screen Symbols . . . . .	259
Enclosure Configuration . . . . .	260
Keys to Use . . . . .	260
Legend for Screen Symbols . . . . .	261
Enclosure Environment . . . . .	262
Keys to Use . . . . .	262
Enclosure Settings . . . . .	263
Keys to Use . . . . .	263
Command Line Tools . . . . .	264
ssaencl Command . . . . .	264
Purpose . . . . .	264
Syntax . . . . .	264
Description. . . . .	264
Flags . . . . .	264
Examples . . . . .	266
Disk Drive Modules in Use . . . . .	267
Configuring a Disk Drive Module to the Using System . . . . .	269
Configuring a 7133 to the Using System . . . . .	270
Unconfiguring a 7133 from the Using System . . . . .	270
MAP Extension . . . . .	271

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
- *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 Adapter: 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.

---

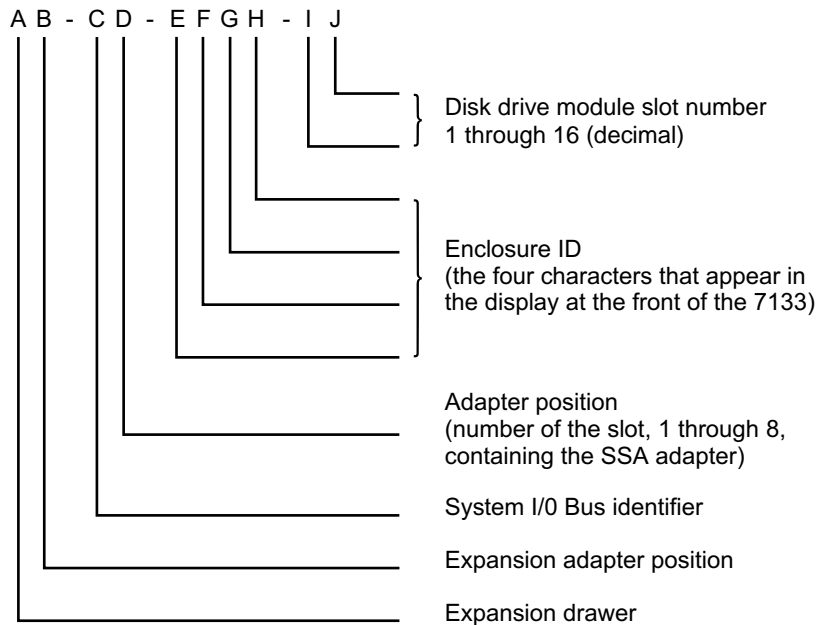
## Addressing SSA Disk Drives

This section describes how SSA devices and adapters are known to the using system programs. The AIX<sup>®</sup> 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.



### 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.

---

## 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 252).
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 252).

---

## 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 139 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      Status
              A1  A2  B1  B2
-----
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 139. 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 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 259).

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
14| 40-I           >>>>       pdisk13           R1E1-02        40-I
15| 40-I           >>>>       pdisk14           R1E1-03        40-I
16| 40-I           >>>>       pdisk15           R1E1-04        >>         40-I
17| 40-I           >>>>       pdisk16           R1E1-05        40-I
18| 40-I           >>>>       pdisk17           R1E1-06        40-I
19| 40-I           >>>>       pdisk18           R1E1-07        |||         40-0
20| 40-0           A1          trent2:****      A2             40-C
21| ?????????????????????????????????????????????????????????????
22| NONE           0000         ****             FRED-09        40-I
23| 40-I           >>>>       pdisk30           FRED-10        >>>>       40-I
24| 40-I           >>>>       pdisk19           FRED-13        40-I
25| 40-I           >>>>       pdisk20           FRED-14
26| 40-I           >>>>       pdisk21           FRED-15        ||         40-C
27| 40-C           A2          severn:ssa0        00-05
28|                severn:ssa0        00-05         B1
29| 40-C           ||          pdisk22           R1E1-09        40-I
30| 40-I           ||          pdisk23           R1E1-10        40-I
31| 40-I           ||          pdisk24           R1E1-11        40-I
32| 40-I           >>>>       pdisk25           R1E1-12        ||         40-C
33| 40-C           B2          severn:ssa0        00-05
34|
35| F3=Cancel      F10=Exit
36|
37|

```

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.
- O000** 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
   | BYPASS
   | BYPASS
   | SSA Disk 13
   | SSA Disk 14
   | --- 15
   | SSA Disk 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] [-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).

##### **-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, 2, 3, 4, and so on.
- S** Resets the “exchanged” flag of the selected FRU.
- 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:  
`ssaenc1 -l enclosure0 -b`
- To display the status and VPD of the controller card in enclosure0, give the command:  
`ssaenc1 -l enclosure0 -c -v`
- To modify the ID for enclosure0 to R2D2, give the command:  
`ssaenc1 -l enclosure0 -I R2D2`
- To display the contents of disk bay (slot) 8 in enclosure0, give the command:  
`ssaenc1 -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 139), 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 5 on page 151.

**Note:** Making an hdisk unavailable is usually a responsibility of system administration.

If the pdisk is not related to an hdisk, go to step 5 on page 151.

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.

SSA RAID Manager          Entry Fields
SSA RAID Array           ssa0
Connection Address / Array Name  hdisk3
* Disk to Remove         095231779F0737K      +

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 5 on page 151.

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 8 on page 152.
- 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 8 on page 152.

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 8 on page 152.

---

## 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

Related Publications . . . . .	273
Web Support Pages. . . . .	274
Location Code Format . . . . .	275
Software and Microcode Errors . . . . .	275
Controller Card Microcode Maintenance . . . . .	275
Downloading Disk Drive Microcode. . . . .	275
Diagnostics Information . . . . .	276
Concurrent Diagnostics . . . . .	276
Nonconcurrent Diagnostics . . . . .	276
Problems Corrected. . . . .	276
Displaying Link and Power Problems . . . . .	276
Service Aids . . . . .	277
Command Line Tools . . . . .	277
Disk Drive Modules in Use . . . . .	278
Configuring a Disk Drive Module to the Using System . . . . .	278
Configuring a 7133 to the Using System . . . . .	278
Unconfiguring a 7133 from the Using System . . . . .	278
MAP Extension . . . . .	278

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 274).
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 `issasddl` 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 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

–48 volt power supply 4

## Numerics

7133 Check light 8

7133 Power light 8

7133 serial number location 37

## A

ac/dc voltage requirements 39

acclimation of disk drives 41

Advanced Multi-Mode Conditioner 25

Advanced SSA Optical Extender (Pair) feature  
description 4

multi-mode configuration

Advanced Multi-Mode Conditioner 25

parts and lights locations

multi-mode configuration 25

single-mode configuration 23

single-mode configuration 23

air temperature 39

altitude 40

Attention notices

concurrent maintenance

fan assemblies 188

power supply assemblies 178

do not switch off the using system 157

fragility of disk drive modules 86, 151, 157

grounding of 7133 65, 69

removal of bypass cards 209

removal of controller card assembly 207

Automatic mode 41

## B

back cover

removal and replacement

Model T40 145

books, related

PC servers 273

RISC systems 252

bypass card jumpers

changing the setting 210

description 45

bypass cards 3

description 41

lights 13, 14

location

Model D40 18

Model T40 20

removal and replacement 209

## C

cable configurations 47

catalog of parts 243

Caution notices

rack stabilizer 218, 221, 229, 232

weight of 7133 219, 222, 225, 228, 231, 234

change enclosure settings information 63

changing disk drive numbers

RISC systems 269

changing the setting of the bypass card jumpers 210

Check light

disk drive module 16

Check light, 7133 8

checking the grounding 65

Model D40 65

Model T40 69

checklist, inspection 64

CHK/PWR-GOOD light 13

command line tools

PC servers 277

RISC systems 264

command line utilities

ssaencl command 264

commands

ssaencl 264

concurrent diagnostics

PC servers 276

RISC systems 256

concurrent maintenance 139

configurations

cable 47

configurations, system 47

configuring a 7133 to the using system

PC servers 278

RISC systems 270

configuring a disk drive module to the using system

PC servers 278

RISC systems 269

connectors

back view 28

internal power connector, Model T40 34

mainline-power connector

–48 V dc 33

mainline-power connector, Model D40 33

mainline-power connector, Model T40 34

Model D40 28

Model T40

back view 30

power control 35

remote-power-on control unit 35

- controller card
  - description 3
  - POSTs (power-on self-tests) 74
- controller card assembly
  - Model D40
    - location 18
  - Model T40
    - location 20
  - removal and replacement 207
- Controller Card Check 12
- controller microcode maintenance 60
- controls 5
  - ID push buttons 11
  - power switch
    - 7133 7
  - PWR/FAULT RESET switch
    - power supply assembly 13
  - remote-power-on control unit On/Off switch 35
- country power cables 250

## D

- Danger notices
  - power cables 148
  - power-supply unit 182
- dc/ac voltage requirements 39
- definition of FRU names used in SRN table 76
- devices, physical location 59
- diagnostic aids
  - controller card POSTs (power-on self-tests) 74
  - disk drive module POSTs (power-on self-tests) 73
  - SRNs (service request numbers) 75
    - FRU names used in table 76
- diagnostics information
  - concurrent diagnostics
    - PC servers 276
    - RISC systems 256
  - nonconcurrent diagnostics
    - PC servers 276
    - RISC systems 256
  - problems corrected
    - PC servers 276
    - RISC systems 256
- dimensions and weight
  - Model D40 39
  - Model T40 39
- disk drive microcode, downloading
  - PC servers 275
  - RISC systems 256
- disk drive microcode maintenance 60
- disk drive module serial number location 37
- disk drive modules
  - acclimation 41
  - Check light 16
  - identification 253
  - installing 157

- disk drive modules (*continued*)
  - Model D40
    - location 18
    - locks 18
  - Model T40
    - location 20
    - locks 20
  - numbering
    - Model D40 18
    - Model T40 20
  - physical location 59
  - POSTs (power-on self-tests) 73
  - power sequencing 40
  - Ready light 15
  - removing 151
  - sizes 40
- disk drive modules in use
  - PC servers 278
  - RISC systems 267
- disk drive status lights 12
- disk drive status lights assembly
  - location
    - Model D40 18
    - Model T40 20
- disk drive status lights assembly, Model D40
  - removal and replacement 197
- disk drive status lights assembly, Model T40
  - removal and replacement 204
- displaying link and power problems
  - PC servers 276
  - RISC systems 257
- downloading disk drive microcode
  - PC servers 275
  - RISC systems 256
- dummy disk drive modules
  - installing 174
  - removing 168

## E

- electrical hazards 64
- electrical requirements 39
- enclosure configuration information 62
- Enclosure Configuration service aid screen
  - RISC systems 260
- enclosure environment information 63
- Enclosure Environment service aid screen
  - RISC systems 262
- Enclosure Settings service aid screen
  - RISC systems 263
- environmental characteristics 39
- ESD cover, Model D40
  - removal and replacement 191
- explosive hazards 64

## F

- fan assemblies
  - Fan Check light 12
  - Fan Power light 12
  - location
    - Model D40 18
    - Model T40 20
  - removal and replacement 188
- Fan Check light 12
- Fan Power light 12
- fibre optic cables
  - multi-mode configuration 25
  - single-mode configuration 23
- fibre optic wrap adapter (Advanced SSA Optical Extenders)
  - multi-mode configuration 25
  - single-mode configuration 23
- fibre optic wrap cable (Advanced SSA Optical Extenders)
  - multi-mode configuration 25
  - single-mode configuration 23
- Forced Bypass mode 44
- Forced Inline mode 43
- Forced Open mode 44
- frame assembly
  - removal and replacement 216
- frequency (voltage) 39
- front bezel assembly, Model T40
  - removal and replacement 199
- front cover
  - location
    - Model D40 18
    - Model T40 20
  - removal and replacement
    - Model T40 144
- front cover (Model D40)
  - removal and replacement 142
- FRU names used in SRN table 76

## G

- glossary of FRU names used in SRN table 76
- grounding check 65
  - Model D40 65
  - Model T40 69

## H

- hazards, safety 64
- hdisks and pdisks
  - explanation of 253
- heat output 40
- humidity 39

## I

- ID display 8
- ID push buttons 11
- identification of disk drive modules 253

- IDs for disk drive module slots
  - Model D40 18
  - Model T40 20
- indicators 5
  - 7133 Check 8
  - 7133 Power 8
  - CHK/PWR-GOOD 13
  - Controller Card Check 12
  - disk drive module Check light 16
  - disk drive module Ready light 15
  - Fan Check 12
  - Fan Power 12
  - ID display 8
  - Link Status (Ready) 13
  - Mode 14
  - Power (Advanced SSA Optical Extenders)
    - multi-mode configuration 25
    - single-mode configuration 23
  - PWR 13
  - Receive (Advanced SSA Optical Extenders)
    - multi-mode configuration 25
    - single-mode configuration 23
- inspection guide 64
  - checklist 64
- internal connections, Model D40 29
- internal connections, Model T40 31
- internal power connector, Model T40 34

## J

- jumpers, bypass cards
  - changing the setting 210
  - description 45

## L

- labels
  - 7133 serial number
    - Model D40 37
    - Model T40 37
  - disk drive module serial number 37
  - last 8 digits of SSA unique ID (UID) 37
  - product information
    - checking 64
  - product-information 37
  - SSA unique ID (UID) 37
- lights 5
  - 7133 Check 8
  - 7133 Power 8
  - CHK/PWR-GOOD 13
  - Controller Card Check 12
  - disk drive module Check 16
  - disk drive module Ready 15
  - disk drive status 12
  - Fan Check 12
  - Fan Power 12
  - ID display 8
  - Link Status (Ready) 13

- lights 5 (*continued*)
  - Mode 14
  - Power (Advanced SSA Optical Extenders)
    - multi-mode configuration 25
    - single-mode configuration 23
  - PWR 13
  - Receive (Advanced SSA Optical Extenders)
    - multi-mode configuration 25
    - single-mode configuration 23
- link and power problems, displaying
  - PC servers 276
  - RISC systems 257
- link errors 134
- link problem determination 134
- Link Status (Ready) light 13
- loop and link configuration information 62

## M

- mainline-power connector
  - 48 V dc 33
- mainline-power connector, Model D40 33
- mainline-power connector, Model T40 34
- maintenance analysis procedures (MAPs) 86
- manuals, related
  - for RISC systems 252
  - PC servers 273
- MAP 2010: 7133 Models D40 and T40 – START 87
- MAP 2020: 7133 Models D40 and T40 – Power 95
- MAP 2022: 7133 Models D40 and T40 – Power-On 99
- MAP 2030: 7133 Models D40 and T40 – Remote Power On Control Feature 103
- MAP 2330: 7133 Models D40 and T40 – optical extender 109
- MAP 2410: 7133 Models D40 and T40 – Repair Verification 132
- MAP extension
  - PC servers 278
  - RISC systems 271
- mechanical hazards 64
- microcode and software errors
  - PC servers 275
  - RISC systems 254
- microcode maintenance
  - controller 60
  - disk drive 60
- Mode light 14
- multi-mode configuration, Advanced SSA Optical Extender (Pair) feature
  - multi-mode configuration
    - Advanced Multi-Mode Conditioner 25

## N

- nonconcurrent diagnostics
  - PC servers 276
  - RISC systems 256

- numbering of disk drive modules
  - Model D40 18
  - Model T40 20

## O

- operator panel
  - Model D40
    - location 18
- operator panel assembly
  - Model T40
    - location 20
- operator panel assembly, Model D40
  - removal and replacement 193
- operator panel assembly and operator panel flexible circuit, Model T40
  - removal and replacement 203
- operator panel flap
  - removal and replacement 141
- operator panel flexible circuit, Model D40
  - removal and replacement 195

## P

- parts catalog 243
- parts locations
  - Advanced SSA Optical Extenders
    - multi-mode configuration 25
    - single-mode configuration 23
  - connectors
    - Model D40 28
  - fiber optic wrap adapter (Advanced SSA Optical Extenders)
    - multi-mode configuration 25
    - single-mode configuration 23
  - fiber optic wrap cable (Advanced SSA Optical Extenders)
    - multi-mode configuration 25
    - single-mode configuration 23
  - Model D40
    - bypass cards 18
    - controller card assembly 18
    - disk drive module 18
    - disk drive module locks 18
    - disk drive status lights assembly 18
    - fan assembly 18
    - front cover 18
    - operator panel assembly 18
    - power supply assembly 18
  - Model T40
    - bypass cards 20
    - controller card assembly 20
    - disk drive module 20
    - disk drive module locks 20
    - disk drive status lights assembly 20
    - front cover 20
    - operator panel assembly 20

- parts locations *(continued)*
    - power supply assemblies 20
    - remote-power-on control unit 22
    - serial-number label
      - 7133 37
    - SSA unique ID (UID)
      - disk drive module 37
  - pdisks and hdisks
    - explanation of 253
  - Physical Link Configuration service aid screen
    - RISC systems 259
  - physical location of a device 59
  - POSTs (power-on self-tests)
    - controller card 74
    - disk drive module 73
  - power and link problems, displaying
    - RISC systems 257
  - power cables, country 250
  - power-control connector 35
  - Power light, 7133 8
  - Power light (Advanced SSA Optical Extenders) 25
    - single-mode configuration
      - single-mode configuration 23
  - power requirements 39
  - power sequencing 40
  - power supply assemblies
    - CHK/PWR-GOOD light 13
    - installing 183
    - location
      - Model D40 18
      - PWR/FAULT RESET light 13
      - PWR light 13
      - removing 178
  - power switch
    - 7133 7
  - power switch and cable assembly, Model T40
    - removal and replacement 205
  - powering on and powering off
    - Model D40 147
    - Model T40 149
  - problem determination
    - POSTs, controller card (power-on self-tests) 74
    - POSTs, disk drive module (power-on self-tests) 73
    - procedures 73
    - SRNs (service request numbers) 75
      - FRU names used in table 76
    - SSA link 134
  - problems corrected
    - PC servers 276
    - RISC systems 256
  - product characteristics 39
  - product-information label 37, 64
  - publications, related
    - PC servers 273
    - RISC systems 252
  - push buttons, ID 11
  - PWR/FAULT RESET switch 13
  - PWR light 13
- ## R
- Ready light
    - disk drive module 15
  - Receive light (Advanced SSA Optical Extenders)
    - multi-mode configuration 25
    - single-mode configuration 23
  - reference information 1
  - related publications
    - PC servers 273
    - RISC systems 252
  - Remote Power On Control feature 4
  - remote-power-on control unit
    - connectors 35
    - location 22
    - On/Off switch 35
    - removal and replacement 212, 214
      - Model D40 212
      - Model T40 214
  - removal and replacement procedures 139
    - 7133 227
    - back cover
      - Model T40 145
    - bypass cards 209
    - controller card assembly 207
    - disk drive modules
      - installing 157
      - removing 151
    - disk drive status lights assembly, Model D40 197
    - disk drive status lights assembly, Model T40 204
    - dummy disk drive modules
      - installing 174
      - removing 168
    - ESD cover, Model D40 191
    - fan assemblies 188
    - frame assembly 216
    - front bezel assembly, Model T40 199
    - front cover
      - Model T40 144
    - front cover (Model D40) 142
    - operator panel assembly, Model D40 193
    - operator panel assembly and operator panel flexible circuit, Model T40 203
    - operator panel flap 141
    - operator panel flexible circuit, Model D40 195
    - power
      - Model D40 147
      - Model T40 149
    - power supply assemblies
      - installing 183
      - removing 178
    - power switch and cable assembly, Model T40 205
    - remote-power-on control unit 212, 214

- removal and replacement procedures 139 *(continued)*
  - Model D40 212
  - Model T40 214
- support rails 235
- rules for SSA loops 47

## S

- safety hazards 64
- serial number location
  - disk drive module 37
  - Model D40 37
  - Model T40 37
- service aid screens
  - Enclosure Configuration
    - RISC systems 260
  - Enclosure Environment
    - RISC systems 262
  - Enclosure Settings
    - RISC systems 263
  - Physical Link Configuration
    - RISC systems 259
- service aids
  - change enclosure settings information 63
  - enclosure configuration information 62
  - enclosure environment information 63
  - loop and link configuration information 62
  - PC servers 277
  - RISC systems 259
- service functions 62
- service inspection guide 64
  - checklist 64
- single-mode configuration, Advanced SSA Optical Extender (Pair) feature 23
- sizes of disk drive modules 40
- slots, disk drive module
  - numbering (IDs)
    - Model D40 18
    - Model T40 20
- software and microcode errors
  - PC servers 275
  - RISC systems 254
- specification for fibre optic cables and connectors 27
- specifications 39
- SRNs (service request numbers) 75
  - FRU names used in table 76
- SSA link error problem determination 134
- SSA link errors 134
- SSA loops
  - disk drive module identification 253
  - physical location of a device 59
- SSA loops and links 3
- SSA system configurations 47
- SSA unique ID (UID) location 37
- ssaencl command 264
- startup sequence for modules 40
- status lights, disk drive 12

- support page URL
  - PC servers 274
  - RISC systems 252
- support rails
  - removal and replacement procedures 235
- switch, power
  - 7133 7
- switch, PWR/FAULT RESET 13
- system configurations 47

## T

- temperature, air 39

## U

- unconfiguring a 7133 from the using system
  - PC servers 278
  - RISC systems 270
- URL for support page
  - PC servers 274
  - RISC systems 252

## V

- vital product data 61
- voltage and frequency 39
- VPD (vital product data) 61

## W

- web support page
  - PC servers 274
  - RISC systems 252
- weight and dimensions
  - Model D40 39
  - Model T40 39



Part Number: 34L3840

Printed in the U.S.A.

GY33-0192-03



34L3840

