

PL1660R

Service Guide



ESCALA

PL1 660R

Service Guide

Hardware

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Contents

Safety and environmental notices	xiii
World Trade safety information	xiii
German safety information	xiii
Laser safety information	xiii
Laser compliance	xiii
Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE	xiv
Product recycling and disposal	xiv
Battery return program	xv
 About this publication.	xvii
How to send your comments	xvii
 Chapter 1. Starting a Service Call	1
 Chapter 2. Isolation Procedures	5
HSL/RIO 12X Isolation Procedures	6
Bus, high-speed link (HSL/RIO/12X) isolation information	6
PCI bus isolation using AIX, Linux, or the HMC	8
Isolating a PCI bus problem while running AIX or Linux	8
Isolating a PCI bus problem from the HMC	8
Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair	9
Breaking down a RIO/HSL/12X or PCI bus reference code	10
DSA translation	11
Card positions	12
Converting the loop number to RIO/HSL/12X port location labels	19
Fiber optic cleaning procedures	21
Status indications for RIO/HSL	21
RIO/HSL/12X connection problems	28
Additional RIO/HSL FRUs	30
Powering on and powering off an I/O expansion unit	30
HSL loop configuration and status form	30
Installed features in a PCI bridge set form	31
RIO/HSL/12X link status diagnosis form	31
CONSL01	32
RIOIP01	33
Main task	33
The ports on both ends of the failed link are in different system units on the loop	34
The port on one end of the failed link is in a system unit and the port on the other end is in an I/O unit	35
The ports on both ends of the failed link are in an I/O unit	36
Cannot power on unit	37
Manually detecting the failed link	38
Refresh the port status	38
RIOIP06	38
RIOIP08	39
RIOIP09	40
RIOIP10	41
RIOIP11	42
RIOIP12	43
RIOIP56	44
Multi-adapter bridge (MAB) isolation procedures	46
MABIP02	46
MABIP03	46

MABIP05	46
MABIP50	47
MABIP51	48
MABIP52	49
MABIP53	51
MABIP54	54
MABIP55	56
Communication isolation procedure	59
COMIP01, COMPIP1	59
Intermittent isolation procedures	62
INTIP03	64
INTIP05	65
INTIP07	65
INTIP08	66
INTIP09	67
INTIP14	69
INTIP16	69
INTIP18	69
INTIP20	69
INTIP24	70
I/O processor (IOP) isolation procedures	72
IOPIP01	74
Using the product activity log	76
IOPIP13	77
IOPIP16	79
IOPIP17	82
IOPIP18	83
IOPIP19	85
IOPIP20	85
IOPIP21	87
IOPIP22	88
IOPIP23	89
IOPIP25	89
IOPIP26	90
IOPIP27	92
IOPIP28	94
IOPIP29	94
IOPIP30	94
IOPIP31	97
IOPIP32	99
IOPIP33	99
IOPIP34	100
IOPIP40	100
IOPIP41	101
Licensed internal code (LIC) isolation procedures	103
LICIP01	104
LICIP03	105
LICIP04	106
LICIP07	106
LICIP08	109
LICIP11	109
How to find the cause code	110
0001	110
0002	110
0004	113
0005	114

0006.	114
0007.	114
0008.	114
0009.	114
000A.	114
000B.	115
000C.	115
000D.	115
000E.	115
0010.	116
0011.	116
0012.	116
0015.	116
0016.	116
0017.	116
0018.	116
0019.	116
001A.	117
001C.	117
001D.	117
001E.	117
001F.	117
0020.	118
0021.	118
0022.	118
0023.	118
0024.	118
0025.	119
0026.	119
0027.	119
0031.	119
0033.	119
0034.	119
0035.	120
0037.	120
0099.	120
LICIP12	120
How to find the cause code	120
0002.	121
0004.	122
0007.	122
0008.	122
0009.	123
000A.	123
000B.	123
000D.	123
000E.	123
002C.	123
002D.	123
002E.	124
002F.	124
0030.	124
0032.	124
0099.	124
LICIP13	124
LICIP14	129

LICIP15	130
LICIP16	132
Logical partition (LPAR) isolation procedure	133
LPRIP01	133
Operations Console isolation procedures	137
OPCIP03	138
Power isolation procedures	141
Power problems	142
Cannot power on system unit	142
Cannot power off system or SPCN-controlled I/O expansion unit	145
Cannot power on SPCN-controlled I/O expansion unit	147
PWR1900	152
PWR1904	153
Instructions for Model MMA	153
PWR1906	155
PWR1906 Instructions for 5094 and 5294 expansion units	155
PWR1907	158
PWR1908	159
PWR1908 instructions for 5088 or 0588 expansion units	159
PWR1909	161
Instructions for 5095, 0595, 5790, 5796, 7311-D11, 7311-D20 and 7314-G30	161
PWR1911	163
PWR1912	169
PWR1917	170
PWR1918	172
PWR1918	172
PWR1920	173
Router isolation procedures	174
RTRIP01	175
RTRIP02	175
RTRIP03	175
RTRIP04	175
PIOCARD	175
SIIOADP	177
RTRIP05	180
RTRIP06	181
RTRIP07	182
RTRIP08	182
SAS isolation procedures	183
SIP3110	185
SIP3111	186
SIP3112	188
SIP3113	189
SIP3120	191
SIP3121	192
SIP3130	192
SIP3131	194
SIP3132	197
SIP3134	198
SIP3140	200
SIP3141	201
SIP3142	202
SIP3143	204
SIP3144	205
SIP3145	208
SIP3146	209

SIP3147	211
SIP3148	212
SIP3149	213
SIP3150	214
SIP3152	216
SIP3153	218
Service processor isolation procedures	219
FSPSP01	222
FSPSP02	223
FSPSP03	223
FSPSP04	223
FSPSP05	224
FSPSP06	224
FSPSP07	224
FSPSP09	224
FSPSP10	224
FSPSP11	225
FSPSP12	225
FSPSP14	225
FSPSP16	225
FSPSP17	225
FSPSP18	226
FSPSP20	226
FSPSP22	226
FSPSP23	226
FSPSP24	227
FSPSP25	227
FSPSP27	227
FSPSP28	228
FSPSP29	228
FSPSP30	229
FSPSP31	229
FSPSP32	229
FSPSP33	230
FSPSP34	231
FSPSP35	231
FSPSP36	231
FSPSP38	232
FSPSP42	233
FSPSP45	233
FSPSP46	234
FSPSP47	234
FSPSP48	234
FSPSP49	234
FSPSP50	234
FSPSP51	235
FSPSP52	235
FSPSP54	235
FSPSP55	235
FSPSP63	237
FSPSP64	237
FSPSPC1	237
FSPSPD1	238
Tape unit isolation procedures	241
TUIP02	243
TUIP03	245

TUIP04	246
TUIP06	250
Tape unit self-test procedure	251
Running the self-test	252
Interpreting the results	252
Tape device ready conditions.	253
Twinaxial workstation I/O processor isolation procedure	255
TWSIP01	256
Workstation adapter isolation procedure.	262
WSAIP01	263
Workstation adapter console isolation procedure	265
Isolating problems on servers that run the AIX or Linux operating systems	267
General problem resolution	268
Problems with loading and starting the operating system (AIX and Linux)	268
Storage I/O card modes and jumpers.	272
Setting or changing the mode of an I/O card	272
How to set or change the mode of an I/O card	272
Mode jumper has been overridden.	273
Mode jumper is missing.	274
SCSI service hints.	274
General SCSI Configuration Checks	274
High Availability or Multiple SCSI System Checks	274
SCSI-2 Single-Ended Adapter PTC Failure Isolation Procedure	275
Determining Where to Start	275
External SCSI-2 Single-Ended Bus PTC Isolation Procedure	275
External SCSI-2 Single-Ended Bus Probable Tripped PTC Causes	276
Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure	276
Internal SCSI-2 Single-Ended Bus Probable Tripped PTC Resistor Causes	278
SCSI-2 Differential Adapter PTC Failure Isolation Procedure	278
External SCSI-2 Differential Adapter Bus PTC Isolation Procedure	278
SCSI-2 Differential Adapter Probable Tripped PTC Causes.	280
Dual-Channel Ultra SCSI Adapter PTC Failure Isolation Procedure	280
64-bit PCI-X Dual Channel SCSI Adapter PTC Failure Isolation Procedure	281
Hot-Swap FRU problem resolution.	281
MAP 0020: Problem determination procedure.	285
MAP 0030: Additional Problem Determination.	292
MAP 0040: Intermittent Problem Isolation	293
MAP 0050: SCSI bus problems	295
Preparing for hot-plug SCSI device or cable deconfiguration	300
Purpose of this procedure	300
After hot-plug SCSI device or cable deconfiguration	301
MAP 0054: PCI-X SCSI Bus Problems	302
MAP 0070: 888 sequence in operator panel display	304
MAP 0230: Platform error problem resolution.	305
MAP 0260: System hangs during resource configuration.	310
MAP 0270: SCSI RAID problem resolution and verification	312
MAP 0280: Console and Keyboard Problem Resolution	317
MAP 0285: Multipath I/O (MPIO) Problem Resolution	317
MAP 0291: Missing Device or Bus Problem Resolution	321
PFW1540: Problem isolation procedures	322
PFW1542: I/O problem isolation procedure	323
PFW1548: Memory and processor subsystem problem isolation procedure	336
Chapter 3. Locating FRUs	347
Physical Locations	348
Addresses	354

Chapter 4. Removing and Replacing FRUs.	357
External Cables	360
Control panel	361
Disk Drive.	366
Replace the disk drive using AIX	366
Replace the disk drive using Linux.	370
Prepare to remove the disk drive	370
Remove the disk drive	373
Replace the disk drive	375
Replace the disk drive nonconcurrently	378
Saving data and initializing the disk unit in i5/OS	381
Initializing the disk unit and copying to disk in i5/OS	392
Restoring profile data	406
Rebuild data on a replacement disk drive using Linux.	407
Replace the disk drive using i5/OS	412
Disk unit enclosure	414
Fans.	422
I/O Backplane	430
Media device enclosure.	451
Memory DIMM	456
RIO/HSL adapter / 12X host channel adapter.	466
PCI adapter	470
Remove and replace a PCI adapter contained in a cassette in the system with the power on in AIX	478
Remove and replace a PCI adapter contained in a cassette in the system with the power on in Linux.	492
Prerequisites for hot-plugging PCI adapters in Linux	504
Verify that the Linux, hot-plug PCI tools are installed	505
Remove and replace a PCI adapter contained in a cassette in the system with the power on in i5/OS	506
C6 PCI adapter.	519
Power supply	522
Removable media	528
Service processor assembly and time-of-day battery	531
Add a redundant service processor assembly.	531
Repair a single service processor assembly	536
Repair a redundant service processor assembly.	549
Service processor cable	560
SMP cable	562
System backplane.	565
System processor assembly	572
Voltage regulator assembly	582
VPD Card.	589
VPD passthru card	593
 Chapter 5. Verifying a repair	 611
Verifying the repair in AIX	612
Verifying the repair in Linux	616
Verifying a repair using an i5/OS system or logical partition	617
 Chapter 6. Closing a service call	 619
Closing a service call using Integrated Virtualization Manager.	625
Closing a service call using AIX or Linux	631
Activating and deactivating LEDs	636
Deactivate a system attention LED or partition LED using the HMC	636
Activate or deactivate identify LED using the HMC.	636
Deactivate a system attention LED or partition LED using the ASMI	637

Activate or deactivate identify LED using the ASMI.	637
Chapter 7. Common Service Procedures	639
Powering on and powering off	641
Determining a primary or alternative console	644
Determining if the system has logical partitions	646
Separating the 571F/575B card set and moving the cache directory card	647
Determining which Processor is the Secondary Service Processor	653
The System Reference Code (SRC) Format Description.	654
System Reference Code (SRC) Information	654
System reference code (SRC) address formats	654
Hardware SRC formats	658
Logical address format	660
LIC-Detected Problem Reference Code Formats	661
Using the Service Action Log.	663
Problems with noncritical resources	664
System Service Tools (SST)	665
Work with communications trace	665
More information from hexadecimal reports	671
Hexadecimal Product Activity Log data	687
Reclaiming IOP cache storage	690
Working with Storage Dumps.	691
Dedicated Service Tools (DST)	692
Accessing Dedicated Service Tools	692
Selecting function 21 from the control panel	693
Control panel function codes on the HMC	693
Performing an IPL to DST	695
Performing an alternate IPL to DST (type D IPL)	696
Start a service tool	697
IPL type, mode, and speed options	697
Printing the System Configuration List	699
Print the system configuration list	699
Details on the system bus, main storage, or processor	700
Hardware Service Manager	701
Managing the Advanced System Management Interface (ASMI)	702
Accessing the ASMI	702
Accessing the ASMI using a Web browser	702
Accessing the ASMI using an ASCII terminal	704
Accessing the ASMI using the HMC	705
Displaying error and event logs	705
Setting the system enclosure type	706
Setting the system identifiers.	707
Viewing vital product data	707
Clearing all deconfiguration errors	708
Service functions	709
Managing dumps	710
Performing dumps.	710
Performing a platform system or service processor dump	710
Using the HMC to perform a system dump.	711
Using the control panel to perform a system dump	711
Using the ASMI to perform a system dump	712
Performing a service processor dump	712
Using the HMC to perform a service processor dump.	712
Using the control panel to perform a service processor dump	713
Using the ASMI to perform a service processor dump.	713
Copying a dump	713

Using an HMC to copy a dump	714
Using the AIX command line to copy a dump	714
Using the Linux command line to copy a dump	714
Using the IBM i5/OS service tools to copy a dump	715
Copying a platform system or SP dump	715
Copying a main storage dump	715
Reporting a dump	716
Using an HMC to report a dump	716
Using the AIX command line to report a dump	717
Using the Linux command line to report a dump	717
Using the i5/OS service tools to report a main storage or platform system or SP dump	717
Deleting a dump	718
Using an HMC to delete a dump	718
Using the AIX command line to delete a dump	719
Using the Linux command line to delete a dump	719
Using the i5/OS service tools to delete a dump	719
Performing an IBM i5/OS main storage dump	720
Using the HMC to perform an IBM i5/OS main storage dump	720
Using the control panel to perform an IBM i5/OS main storage dump	720
Performing a slow boot	722
Using the HMC to perform a slow boot	722
Using the control panel to perform a slow boot	722
Using the ASMI menus to perform a slow boot	723
Determining the primary or alternate console	724
Primary console workstation requirements	724
Find the primary console when the system is operational	725
Find the primary console when the system power is off	725
Resetting the service processor	726
Resetting the managed system connection from the HMC	727
Checking for a duplicate IP address	728
Running the online and eServer stand-alone diagnostics	729
Running the online diagnostics	729
Running the online diagnostics in service mode	730
Running the online diagnostics in service mode with an HMC attached	730
Running the online diagnostics in service mode without an HMC attached	730
Running the online diagnostics in maintenance mode	731
Running the online diagnostics in concurrent mode	731
Running the eServer stand-alone diagnostics from CD-ROM	732
Running the eServer stand-alone diagnostics from CD on a server with an HMC attached	733
Selecting testing options	733
Running the eServer stand-alone diagnostics from CD on a server without an HMC attached	734
Selecting testing options	735
Running the eServer stand-alone diagnostics from a Network Installation Management server	736
Performing an IBM i5/OS main storage dump	739
Using the HMC to perform an IBM i5/OS main storage dump	739
Using the control panel to perform an IBM i5/OS main storage dump	739
Chapter 8. Part Information	741
Appendix. Accessibility features	753
Accessibility features	753
IBM and accessibility	753
Notices	755
Trademarks	756
Electronic emission notices	757

Class A Notices.	757
Terms and conditions	760

Safety and environmental notices

Safety notices may be printed throughout this guide:

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the U.S. English publications.

German safety information

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

Laser safety information

IBM servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

Laser compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:

This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

(C026)

CAUTION:

Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

CAUTION:

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

CAUTION:

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE

The following comments apply to the IBM servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metallically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

Note: All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

Esta unidad debe reciclarse o desecharse de acuerdo con lo establecido en la normativa nacional o local aplicable. IBM recomienda a los propietarios de equipos de tecnología de la información (TI) que reciclen responsablemente sus equipos cuando éstos ya no les sean útiles. IBM dispone de una serie de programas y servicios de devolución de productos en varios países, a fin de ayudar a los propietarios de equipos a reciclar sus productos de TI. Se puede encontrar información sobre las ofertas de reciclado de productos de IBM en el sitio web de IBM <http://www.ibm.com/ibm/environment/products/prp.shtml>.



EU Only

Note: This mark applies only to countries within the European Union (EU) and Norway.

Appliances are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used

appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

L'étiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

Battery return program

This product may contain sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and other battery packs from IBM Equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Please have the IBM part number listed on the battery available prior to your call.

For Taiwan: Please recycle batteries.



For the European Union:



EU Only

Note: This mark applies only to countries within the European Union (EU).

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Les batteries ou emballages pour batteries sont étiquetés conformément aux directives européennes 2006/66/EC, norme relative aux batteries et accumulateurs en usage et aux batteries et accumulateurs usés. Les directives déterminent la marche à suivre en vigueur dans l'Union Européenne pour le retour et le recyclage des batteries et accumulateurs usés. Cette étiquette est appliquée sur diverses batteries pour indiquer que la batterie ne doit pas être mise au rebut mais plutôt récupérée en fin de cycle de vie selon cette norme.

バッテリーあるいはバッテリー用のパッケージには、EU 諸国に対する廃電気電子機器指令 2006/66/EC のラベルが貼られています。この指令は、バッテリーと蓄電池、および廃棄バッテリーと蓄電池に関するものです。この指令は、使用済みバッテリーと蓄電池の回収とリサイクルの骨子を定めているもので、EU 諸国にわたって適用されます。このラベルは、使用済みになったときに指令に従って適正な処理をする必要があることを知らせるために種々のバッテリーに貼られています。

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local IBM representative.

For California:

Perchlorate Material - special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials. This product, part, or both may include a lithium manganese dioxide battery which contains a perchlorate substance.

About this publication

This publication provides service providers with maintenance information for the IBM Power 570 (9117-MMA and 9406-MMA). This publication includes start-of-call procedures, isolation procedures, and removal and replacement procedures.

Use this information for reference only. To perform any service action, use the Hardware Management Console (HMC).

For information about the accessibility features of this product, for users who have a physical disability, see "Accessibility features," on page 753.

How to send your comments

Your feedback is important in helping to provide the most accurate and highest quality information. If you have any comments about this publication, use the **Feedback** button at <http://www.ibm.com/systems/infocenter>. Alternatively, you can send your comments to pubsinfo@us.ibm.com. Be sure to include the name of the book, the form number of the book, and the specific location of the text you are commenting on (for example, a page number or table number).

Chapter 1. Starting a Service Call

This is the starting point for service actions. Begin all service actions with this procedure.

From this point, you will be guided to the appropriate information to help you perform the necessary steps to repair the server.

Note: In this topic, **control panel** and **operator panel** are synonymous.

Before beginning, Record information to help you return the server to the same state that the customer typically uses, such as:

- The IPL type that the customer typically uses for the server.
- The **IPL mode** that is used by the customer on this server.
- The way in which the server is configured or partitioned.

1.

Has problem analysis been performed using the procedures in *Problem Analysis*, SA76-0111?

Yes	No
↓	Perform problem analysis using the procedures in <i>Problem Analysis</i> , SA76-0111.

2.

Is the failing server managed by a Hardware Management Console (HMC)?

No	Yes
↓	Continue with step 6 on page 2.

3.

Do you have a Field Replaceable Unit (FRU), location code, and an action plan to replace a failing FRU?

No	Yes
↓	Go to Chapter 3, "Locating FRUs," on page 347.

4.

Do you have an action plan to perform an isolation procedure?

No	Yes
↓	Go to Chapter 2, "Isolation Procedures," on page 5.

5.

Choose an action from the following symptom list:

- You have a reference code but no action plan - go to *Problem Analysis*, SA76-0111.
- There is a hardware problem that does not generate a reference code - use the Table of Contents to find an appropriate isolation procedure or contact your next level of support.
- To check your server's firmware level or to update it - see the system's operation guide.
- You have an engineering change (EC) or a hardware upgrade to apply - use the instructions provided with the change or upgrade.
- You suspect a software problem - contact software support
- To perform diagnostics or another service function - use the Table of Contents to locate the common service procedure.

This ends the procedure.

6.

Is the HMC connected and functional?

Yes

↓

No

Start the HMC and attach it to the server. If you experience a problem with the HMC, refer to the *Service Guide for the Hardware Management Console Models 7042-CR4, 7042-C06 and 7042-C07*, SA76-0120. When the HMC is connected and functional, continue with the next step.

7.

Perform the following steps from the HMC that is used to manage the server. During these steps, refer to the service data that was gathered earlier:

1. In the Navigation Area, open **Service Management**.
2. Select **Manage Events**. The Manage Serviceable Events - Select Serviceable Events panel will be displayed.
3. Select the status of **Open**.
4. Select all other selections to **ALL** and click **OK**.
5. Scroll through the list and verify that there is a problem with the status of **Open** to correspond with the customer's reported problem.

Note: If you are unable to locate the reported problem, and there is more than one open problem near the time of the reported failure, use the earliest problem in the list.

Do you find the reported problem, or an open problem near the time of the reported problem?

Yes

↓

No

Go to step 3 on page 1.

8.

Select the serviceable event you want to repair, and select **Repair** from the Selected menu.

Note: If the **Repair** procedures are not available, go to step 3 on page 1.

Follow the instructions displayed on the HMC.

After you complete the repair procedure, the system automatically closes the serviceable event. **This ends the procedure.**

Chapter 2. Isolation Procedures

Isolation procedures are used together with diagnostic programs that are part of server firmware.

If a server is connected to an HMC, these procedures are available on the HMC. Use the HMC procedures to continue isolating the problem. If the server does not have an HMC and you are directed to perform an isolation procedure, the procedures documented here are needed to continue isolating a problem.

“HSL/RIO 12X Isolation Procedures” on page 6

Use RIO/HSL/12X isolation procedures if there is no HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

“Multi-adapter bridge (MAB) isolation procedures” on page 46

Use multi-adapter bridge (MAB) isolation procedures if there is no HMC attached to the server. If the server is connected to the HMC, use the procedures that are available on the HMC to continue FRU isolation.

“Communication isolation procedure” on page 59

This topic contains the procedure necessary to isolate a communications failure. Please read and observe the following warnings when using this procedure.

“Intermittent isolation procedures” on page 62

These procedures help you to correct an intermittent problem.

“I/O processor (IOP) isolation procedures” on page 72

Use these procedures to isolate a failure in the multiple function I/O card.

“Licensed internal code (LIC) isolation procedures” on page 103

Use this section to isolate licensed internal code (LIC) problems.

“Logical partition (LPAR) isolation procedure” on page 133

These procedures help you to identify logical partition (LPAR) configuration conditions and the associated corrective actions.

“Operations Console isolation procedures” on page 137

These procedures help you to isolate a failure with the Operations Console.

“Power isolation procedures” on page 141

Contains procedures for isolating a problem in the power system.

“Router isolation procedures” on page 174

These procedures serve as a guide to the correct isolation procedures from the reference code tables.

“SAS isolation procedures” on page 183

Use the following Serial Attached SCSI (SAS) isolation procedures if an HMC is not attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

“Service processor isolation procedures” on page 219

Use service processor isolation procedures if there is no HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

“Tape unit isolation procedures” on page 241

This topic contains the procedures necessary to isolate a failure in a tape device.

“Isolating problems on servers that run the AIX or Linux operating systems” on page 267

Use the procedures for AIX or Linux servers if there is not an HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

HSL/RIO 12X Isolation Procedures

Use RIO/HSL/12X isolation procedures if there is no HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

“Bus, high-speed link (HSL/RIO/12X) isolation information”

Symbolic FRUs, failing items, and bus isolation procedures use the terms “partition” and “logical partition” to indicate any single partition in a system that has multiple partitions. If the system you are working on does not have multiple partitions, then the terms refer to the primary partition.

“CONSL01” on page 32

Use this procedure to exchange the I/O processor (IOP) for the system or partition console of i5/OS.

“RIOIP01” on page 33

Use this procedure to isolate a failure in a RIO/HSL/12X loop using i5/OS® service tools.

“RIOIP06” on page 38

Use HSM to examine the RIO/HSL/12X Loop to determine if other systems are connected to the loop.

“RIOIP08” on page 39

Starting with the unit ID and RIO/HSL/12X port for one end of an RIO/HSL/12X cable, determine the unit ID and port location for the other end.

“RIOIP09” on page 40

This procedure offers a description and service action for RIO/HSL/12X reference code B600 6982.

“RIOIP10” on page 41

Use this procedure to determine if the RIO/HSL/12X loop is complete (with both primary and redundant paths functioning for each unit on the loop).

“RIOIP11” on page 42

Use this procedure to recover from a B7xx 6982 RIO/HSL/12X failure.

“RIOIP12” on page 43

Use this procedure to recover from a B7xx 6985 RIO/HSL/12X failure.

“RIOIP56” on page 44

Use this procedure to restore the RIO 12X link to optimal bandwidth.

Bus, high-speed link (HSL/RIO/12X) isolation information

Symbolic FRUs, failing items, and bus isolation procedures use the terms “partition” and “logical partition” to indicate any single partition in a system that has multiple partitions. If the system you are working on does not have multiple partitions, then the terms refer to the primary partition.

Read all safety notices below before servicing the system and while performing a procedure.

Note: Unless instructed otherwise, always power off the system before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

“PCI bus isolation using AIX, Linux, or the HMC” on page 8

Use this procedure if you are isolating a PCI bus problem from the HMC or while running AIX® or Linux®.

“Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair” on page 9

Use this procedure to verify a repair for the high-speed link, a system PCI bus, or for a multi-adapter bridge.

“Breaking down a RIO/HSL/12X or PCI bus reference code” on page 10

Word 7 of the reference code allows you to determine the correct bus number, bus type, multi-adapter bridge number, multi-adapter bridge function number, and logical card number from the Direct Select Address (DSA).

“DSA translation” on page 11

The Direct Select Address (DSA) may be coded in word 7 of the reference code.

“Card positions” on page 12

The following information specifies card positions for the various server models.

“Converting the loop number to RIO/HSL/12X port location labels” on page 19

Use the following table to convert the RIO/HSL12X loop number to port location labels.

“Fiber optic cleaning procedures” on page 21

Use the fiber optic cleaning kit and the fiber optic cleaning procedures in “SY27-2604 Fiber Optic

Cleaning Procedures” for all fiber channel connections such as those used in optical high speed link (HSL) connections or fibre channel attached devices.

“Status indications for RIO/HSL” on page 21

A status indication for a RIO/HSL loop is identified in the reference code.

“RIO/HSL/12X connection problems” on page 28

The failing component is the RIO/HSL/12X connection

“HSL loop configuration and status form” on page 30

Use this HSL loop configuration and status form to record the status of the HSL ports in the loop.

“Installed features in a PCI bridge set form” on page 31

Use this form to record the PCI bridge set card positions, and multi-adapter bridge function numbers.

“RIO/HSL/12X link status diagnosis form” on page 31

Use this form to record the status of the RIO/HSL/12X links.

PCI bus isolation using AIX, Linux, or the HMC

Use this procedure if you are isolating a PCI bus problem from the HMC or while running AIX or Linux.

Isolating a PCI bus problem while running AIX or Linux:

Can the operating system be IPLed?

- **No:** Perform “MABIP52” on page 49. **This ends the procedure.**
- **Yes:** Choose from the following:
 - If you are running AIX, go to “Running the online and eServer stand-alone diagnostics” on page 729 to isolate the PCI bus failure with online diagnostics in concurrent mode.
 - If you are running Linux, go to “Running the online and eServer stand-alone diagnostics” on page 729 to isolate the PCI bus failure with stand-alone diagnostics.

This ends the procedure.

Isolating a PCI bus problem from the HMC:

If you have locations for the FRUs given in the serviceable event view of the error log, use those locations and exchange:

1. Did the serviceable event view provide the location(s) for the failing FRU(s)?
 - Yes:** Use those locations to exchange the given FRUs one at a time until the problem is resolved. **This ends the procedure.**
 - No:** Continue with the next step.
2. Go to “DSA translation” on page 11 to determine the Direct Select Address (DSA).
3. Perform the following:
 - a. Record the bus number value (BBBB) from the DSA and convert it to decimal format.
 - b. Search for the decimal system bus number in the partition resources screens on the HMC.
 - c. Record the frame or unit type and continue with the next step.
4. Record the Cc value from the DSA. Is the Cc value greater than 00?
 - Yes:** Continue with the next step.
 - No:** The multi-adapter bridge number and the multi-adapter function number have not been identified, and so the card slot cannot be identified using the DSA. Look in the HMC partition resources for non-reporting or non-operational hardware. That will indicate which cards in which positions need to be replaced. Refer to Finding part locations for the model you are working on for information about the multi-adapter bridge that controls those card slots. That multi-adapter bridge is also a FRU. **This ends the procedure.**
5. Is the right-most character (c) F?
 - No:** Continue with the next step.
 - Yes:** Only the multi-adapter bridge number has been identified. Record the multi-adapter bridge number (left-most character of Cc) for later use. Since the card slot cannot be identified with the

DSA, refer to Finding part locations for the model you are working on for information about the multi-adapter bridge that controls the card slots. Consider all card slots controlled by the multi-adapter bridge to be FRUs. **This ends the procedure.**

6. Refer to "Card positions" on page 12 and use the BBBB and Cc values that you recorded to identify the card position. Then return to the procedure that sent you here. **This ends the procedure.**

Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair

Use this procedure to verify a repair for the high-speed link, a system PCI bus, or for a multi-adapter bridge.

Within this procedure, the terms "system" and "logical partition" are interchangeable when used individually.

1. Perform this procedure from the logical partition you were in when you were sent to this procedure, or from the HMC if this error was worked from the HMC.
2. If you previously powered off a system or logical partition, or an expansion unit during this service action, then you need to power it off again.
3. Install all cards, cables, and hardware, ensuring that all connections are tight. You can use the system configuration list to verify that the cards are installed correctly.
4. Power on any expansion unit, logical partition or system unit that was powered off during the service action. Is one of the following true?
 - If the system or a logical partition was powered off during the service action, does the IPL complete successfully to the IPL or does Install the System display?
 - If an expansion tower was powered off during the service action, does the expansion tower power on complete successfully?
 - If any IOP or IOA card locations were powered off using concurrent maintenance during the service action, do the slots power on successfully?
 - If you exchanged a FRU that should appear as a resource or resources to the system, such as an IOA, or I/O bridge, does the new FRU's resource appear in HSM as operational?

Yes: Continue with the next step.

No: Verify that you have followed the power off, remove and replace, and power-on procedures correctly. When you are sure that you have followed the procedures correctly, then exchange the next FRU in the list. If there are no more FRUs to exchange, then contact your next level of support. **This ends the procedure.**

5. Does the system or logical partition have mirrored protection? Select Yes if you are not sure.

No: Continue with the next step.

Yes: From the Dedicated Service Tools (DST) display, select **Work with disk units**, and resume mirrored protection for all units that have a suspended status.

6. Choose from the following options:

- If you are working from a partition, from the Start a Service Tool display, select **Hardware service manager** and look for the I/O processors that have a failed or missing status.
- If you are working from a HMC, look at the CEC properties.

a. Choose the I/O tab.

b. Look for IOAs or IOPs that have a failed or missing status.

Are all I/O processor cards operational?

Note: Ignore any IOPs that are listed with a status of not connected.

Yes: Go to step 10 on page 10.

No: Display the logical hardware resource information for the non-operational I/O processors. For all I/O processors and I/O adapters that are failing; record the bus number (BBBB), board (bb) and card information (Cc). Continue with the next step.

7. Perform the following:
 - a. Return to the Dedicated Service Tools (DST) display.
 - b. Display the Product Activity Log.
 - c. Select **All logs** and search for an entry with the same bus, board, and card address information as the non-operational I/O processor. Do not include informational or statistical entries in your search. Use only entries that occurred during the last IPL.

Did you find an entry for the SRC that sent you to this procedure?

No: Continue with the next step.

Yes: Ask your next level of support for assistance. **This ends the procedure.**

8. Did you find a B600 6944 SRC that occurred during the last IPL?

Yes: Continue with the next step.

No: A different SRC is associated with the non-operational I/O processor. Go to the Chapter 1, "Starting a Service Call," on page 1 procedure and look up the new SRC to correct the problem.

This ends the procedure.

9. Is there a B600 xxxx SRC that occurred during the last IPL other than the B600 6944 and informational SRCs?

Yes: Use the other B600 xxxx SRC to determine the problem. Go to the Chapter 1, "Starting a Service Call," on page 1 and look up the new SRC to correct the problem. **This ends the procedure.**

No: You connected an I/O processor in the wrong card position. Use the system configuration list to compare the cards. When you have corrected the configuration, go to the start of this procedure to verify the bus repair. **This ends the procedure.**

10. If in a partition, use the hardware service manager function to print the system configuration list.

Are there any configuration mismatches?

No: Continue with the next step.

Yes: Ask your next level of support for assistance. **This ends the procedure.**

11. You have verified the repair of the system bus.

- a. If for this service action only an expansion unit was powered off or only the concurrent maintenance function was used for an IOP or IOA, then continue with the next step.
- b. Otherwise, perform the following to return the system to the customer:
 - 1) Power off the system or logical partition. See "Powering on and powering off" on page 641 for details.
 - 2) Select the operating mode with which the customer was originally running.
 - 3) Power on the system or logical partition.

12. If the system has logical partitions and the entry point SRC was B600 xxxx, then check for related problems in other logical partitions that could have been caused by the failing part. **This ends the procedure.**

Breaking down a RIO/HSL/12X or PCI bus reference code

Word 7 of the reference code allows you to determine the correct bus number, bus type, multi-adapter bridge number, multi-adapter bridge function number, and logical card number from the Direct Select Address (DSA).

Physical card slot labels and card positions for PCI buses are determined by using the DSA and the appropriate system unit or I/O unit card positions. See "Card positions" on page 12 for details.

Table 1. RIO/HSL/12X and PCI reference code breakdown

Word of the reference code	Control panel function	Panel function characters	Format	Description
1	11	1–8	B600 uuuu or B700 uuuu	uuuu = unit reference code (69xx)
1 – extended reference code information	11	9–16	iiii	Frame ID of the failing resource
1 – extended reference code information	11	17–24	ffff	Frame location
1 – extended reference code information	11	25–32	bbbb	Board position
2	12	1–8	MIGVEP62 or MIGVEP63	See Hardware SRC formats.
3	12	9–16	cccc cccc	Component reference code
4	12	17–24	pppp pppp	Programming reference code
5	12	25–32	qqqq qqqq	Program reference code high order qualifier
6	13	1–8	qqqq qqqq	Program reference code low order qualifier
7	13	9–16	BBBB Ccbb	See “DSA translation”
8	13	17–24	TTTT MMMM	Type (TTTT) and model (MMMM) of the failing item (if not zero)
9	13	25–32	uuuu uuuu	Unit address (if not zero)

DSA translation

The Direct Select Address (DSA) may be coded in word 7 of the reference code.

This is either a PCI system bus number or a RIO/HSL/12X loop number, depending on the type of error. With the information obtained here, and the information in either the card position table (for PCI bus numbers) or the information in the loop-number-to-NIC-port table (for RIO/HSL/12X loop numbers), you should be able to isolate a failing PCI bus or RIO/HSL/12X loop. Follow the instructions below to translate the DSA:

1. Break down the DSA into the bus number, multi-adapter bridge number, and multi-adapter bridge function number. The DSA is of the form BBBB Ccxx, and breaks down into the following parts:
 - BBBB = bus number
 - C = multi-adapter bridge number
 - c = multi-adapter bridge function number
 - xx = not used
2. Is the bus number less than 0684?

Yes: The bus number is a PCI bus number. Convert the number to decimal, and then continue with the next step.

No: The bus number is a RIO/HSL/12X loop number. Convert the number to decimal, and then go to step 4 on page 12.

3. Use one of the following guides to determine the type of processor or I/O enclosure in which the bus is located:

- If you are using a Hardware Management Console interface, view the managed system's properties on the Hardware Management Console. Then select the IO tab. The bus numbers will be displayed.
- If you are using AIX or Linux, use the command line interface to determine the enclosure type. On the command line, type the following:

```
lshwres -r io --rsubtype bus
```

The result will be in the form of:

```
unit_phys_loc=Uxxxx.yyy.zzzzzzz,bus_id=a, .....
```

Find the bus id "a" entry that matches the decimal bus number you determined in step 2. Using the corresponding Uxxxx value, look up the unit model or enclosure type using the Unit Type and Locations table in Chapter 3, "Locating FRUs," on page 347. Continue with the next step.

4. Perform one of the following:

- If you are working with a PCI bus number, refer to "Card positions" to search for the bus number, the multi-adapter bridge number, and the multi-adapter bridge function number that matches the processor enclosure or I/O enclosure where the bus is located. **This ends the procedure.**
- If you are working with a RIO/HSL/12X loop number, refer to "Converting the loop number to RIO/HSL/12X port location labels" on page 19 to determine the starting ports for the RIOHSL/12X loop with the failed link. **This ends the procedure.**

Card positions

The following information specifies card positions for the various server models.

Use the table for the model you are working on:

Card positions for model MMA L4

Card positions for model MMA ML8 (L4+)

Card positions for model MMA ML12 (ML8+)

Card positions for model MMA ML16 (ML12+)

Card positions for 5088, 0588, 5094, 5096, 5294, 5296, and 8094-002 expansion units

Card positions for 5095, 0595, and 7311-D20 expansion units

Card positions for 7040-61D expansion unit

Card positions for 7311-D10, 7311-D11, and 5790 expansion units

Card positions for 7314-G30 expansion unit

Table 2. Card positions for model MMA L4

Bus number in DSA (hexadecimal/ decimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
200/512	2	0	Embedded SAS controller	-P1
	2	1		
	2	4	Embedded USB controller	-P1
	2	F	Multi-adapter bridge	-P1
201/513	N/A	N/A	PCI-X IOA card	-P1-C4
202/514	N/A	N/A	PCI-X IOA card	-P1-C5
204/516	N/A	N/A	PCI-E IOA card	-P1-C1
205/517	N/A	N/A	PCI-E IOA card	-P1-C2
206/518	N/A	N/A	PCI-E IOA card	-P1-C3

Table 2. Card positions for model MMA L4 (continued)

Bus number in DSA (hexadecimal/ decimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
207/519	N/A	N/A	PCI-E IOA card	-P1-C6

Table 3. Card positions for model MMA ML8 (L4+)

Bus number in DSA (hexadecimal/ decimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
220/544	2	0	Embedded SAS controller	-P1
	2	1		
	2	4	Embedded USB controller	-P1
	2	F	Multi-adapter bridge	-P1
221/545	N/A	N/A	PCI-X IOA card	-P1-C4
222/546	N/A	N/A	PCI-X IOA card	-P1-C5
224/548	N/A	N/A	PCI-E IOA card	-P1-C1
225/549	N/A	N/A	PCI-E IOA card	-P1-C2
226/550	N/A	N/A	PCI-E IOA card	-P1-C3
227/551	N/A	N/A	PCI-E IOA card	-P1-C6

Table 4. Card positions for model MMA ML12 (ML8+)

Bus number in DSA (hexadecimal/ decimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
240/576	2	0	Embedded SAS controller	-P1
	2	1		
	2	4	Embedded USB controller	-P1
	2	F	Multi-adapter bridge	-P1
241/577	N/A	N/A	PCI-X IOA card	-P1-C4
242/578	N/A	N/A	PCI-X IOA card	-P1-C5
244/580	N/A	N/A	PCI-E IOA card	-P1-C1
245/581	N/A	N/A	PCI-E IOA card	-P1-C2
246/582	N/A	N/A	PCI-E IOA card	-P1-C3
246/583	N/A	N/A	PCI-E IOA card	-P1-C6

Table 5. Card positions for model MMA ML16 (ML12+)

Bus number in DSA (hexadecimal/ decimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
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Table 5. Card positions for model MMA ML16 (ML12+) (continued)

260/608	2	0	Embedded SAS controller	-P1
	2	1		
	2	4	Embedded USB controller	-P1
	2	F	Multi-adapter bridge	-P1
261/609	N/A	N/A	PCI-X IOA card	-P1-C4
262/610	N/A	N/A	PCI-X IOA card	-P1-C5
264/612	N/A	N/A	PCI-E IOA card	-P1-C1
265/613	N/A	N/A	PCI-E IOA card	-P1-C2
266/614	N/A	N/A	PCI-E IOA card	-P1-C3
267/615	N/A	N/A	PCI-E IOA card	-P1-C6

Notes:

1. Service 5294 expansion units as two independent 5094 units.

Table 6. Card positions for 5088, 0588, 5094, 5096, 5294, 5296, and 8094-002 expansion units

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	2	0 and 1	PCI IOP or IOA card	C01
xxxx (assigned by LIC)	2	2 and 3	PCI IOP or IOA card	C02
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C03
xxxx (assigned by LIC)	2	6 and 7	IOA card	C04
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1
xxxx (assigned by LIC)	2	0 and 1	PCI IOP or IOA card	C05
xxxx (assigned by LIC)	2	2	PCI IOP or IOA card	C06
xxxx (assigned by LIC)	2	3	PCI IOP or IOA card	C07
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C08
xxxx (assigned by LIC)	2	6 and 7	IOA card	C09
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1
xxxx (assigned by LIC)	2	0 and 1	PCI IOP or IOA card	C11
xxxx (assigned by LIC)	2	2	PCI IOP or IOA card	C12
xxxx (assigned by LIC)	2	3	PCI IOP or IOA card	C13

Table 6. Card positions for 5088, 0588, 5094, 5096, 5294, 5296, and 8094-002 expansion units (continued)

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C14
xxxx (assigned by LIC)	2	6 and 7	IOA card	C15
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1

Table 7. Card positions for 5095, 0595, and 7311-D20 expansion units

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	2	0 and 1	PCI IOP	C01
xxxx (assigned by LIC)	2	2 and 3	PCI IOP or IOA card	C02
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C03
xxxx (assigned by LIC)	2	6 and 7	IOA card	C04
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1
xxxx (assigned by LIC)	2	Not used	Not used	C05
xxxx (assigned by LIC)	2	0 and 1	PCI IOP	C06
xxxx (assigned by LIC)	2	2 and 3	PCI IOP or IOA card	C07
xxxx (assigned by LIC)	2	6 and 7	IOA card	C08
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1

Table 8. Card positions for 7040-61D expansion unit

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
LEFT SIDE I/O PLANAR (-P1)				
Lower PCI bus number	2	0	PCI IOA card	-P1-I1 (64 bit)
Lower PCI bus number	2	1		
Lower PCI bus number	2	2	PCI IOA card	-P1-I2 (64 bit)
Lower PCI bus number	2	3		
Lower PCI bus number	2	4	PCI IOA card	-P1-I3 (64 bit)
Lower PCI bus number	2	5		
Lower PCI bus number	2	6	PCI IOA card	-P1-I4 (64 bit)
Lower PCI bus number	2	7		

Table 8. Card positions for 7040-61D expansion unit (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Lower PCI bus number	2	F	Multi-adapter bridge	-P1
Middle PCI bus number	2	0	PCI IOA card	-P1-I5 (64 bit)
Middle PCI bus number	2	1		
Middle PCI bus number	2	2	PCI IOA card	-P1-I6 (64 bit)
Middle PCI bus number	2	3		
Middle PCI bus number	2	4	Embedded SCSI controller 1	n/a
Middle PCI bus number	2	5		
Middle PCI bus number	2	6	PCI IOA card	-P1-I7 (64 bit)
Middle PCI bus number	2	7		
Middle PCI bus number	2	F	Multi-adapter bridge	-P1
Higher PCI bus number	2	0	PCI IOA card	-P1-I8 (64 bit)
Higher PCI bus number	2	1		
Higher PCI bus number	2	2	PCI IOA card	-P1-I9 (64 bit)
Higher PCI bus number	2	3		
Higher PCI bus number	2	4	Embedded SCSI controller 2	n/a
Higher PCI bus number	2	5		
Higher PCI bus number	2	6	PCI IOA card	-P1-I10 (64 bit)
Higher PCI bus number	2	7		
Higher PCI bus number	2	F	Multi-adapter bridge	-P1
RIGHT SIDE I/O PLANAR (-P2)				
Lower PCI bus number	2	0	PCI IOA card	-P2-I1 (64 bit)
Lower PCI bus number	2	1		

Table 8. Card positions for 7040-61D expansion unit (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Lower PCI bus number	2	2	PCI IOA card	-P2-I2 (64 bit)
Lower PCI bus number	2	3		
Lower PCI bus number	2	4	PCI IOA card	-P2-I3 (64 bit)
Lower PCI bus number	2	5		
Lower PCI bus number	2	6	PCI IOA card	-P2-I4 (64 bit)
Lower PCI bus number	2	7		
Lower PCI bus number	2	F	Multi-adapter bridge	-P2
Middle PCI bus number	2	0	PCI IOA card	-P2-I5 (64 bit)
Middle PCI bus number	2	1		
Middle PCI bus number	2	2	PCI IOA card	-P2-I6 (64 bit)
Middle PCI bus number	2	3		
Middle PCI bus number	2	4	Embedded SCSI controller 1	n/a
Middle PCI bus number	2	5		
Middle PCI bus number	2	6	PCI IOA card	-P2-I7 (64 bit)
Middle PCI bus number	2	7		
Middle PCI bus number	2	F	Multi-adapter bridge	-P2
Higher PCI bus number	2	0	PCI IOA card	-P2-I8 (64 bit)
Higher PCI bus number	2	1		
Higher PCI bus number	2	2	PCI IOA card	-P2-I9 (64 bit)
Higher PCI bus number	2	3		
Higher PCI bus number	2	4	Embedded SCSI controller 2	n/a
Higher PCI bus number	2	5		

Table 8. Card positions for 7040-61D expansion unit (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Higher PCI bus number	2	6	PCI IOA card	-P2-I10 (64 bit)
Higher PCI bus number	2	7		
Higher PCI bus number	2	F	Multi-adapter bridge	-P2

Table 9. Card positions for 7311-D10, 7311-D11, and 5790 expansion units

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Lower PCI bus number	2	0	PCI IOA card	-P1-C1 (64 bit)
Lower PCI bus number	2	1		
Lower PCI bus number	2	2	PCI IOA card	-P1-C2 (64 bit)
Lower PCI bus number	2	3		
Lower PCI bus number	2	4	Unused	n/a
Lower PCI bus number	2	5		
Lower PCI bus number	2	6	PCI IOA card	-P1-C3 (64 bit)
Lower PCI bus number	2	7		
Lower PCI bus number	2	F	Multi-adapter bridge	-P1
Higher PCI bus number	2	0	PCI IOA card	-P1-C4 (64 bit)
Higher PCI bus number	2	1		
Higher PCI bus number	2	2	PCI IOA card	-P1-C5 (64 bit)
Higher PCI bus number	2	3		
Higher PCI bus number	2	4	Unused	n/a
Higher PCI bus number	2	5		
Higher PCI bus number	2	6	PCI IOA card	-P1-C6 (64 bit)
Higher PCI bus number	2	7		

Table 9. Card positions for 7311-D10, 7311-D11, and 5790 expansion units (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Higher PCI bus number	2	F	Multi-adapter bridge	-P1

Table 10. Card positions for 7314-G30 expansion unit

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C1 (64 bit)
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C2(64 bit)
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C3(64 bit)
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C4(64 bit)
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C5(64 bit)
xxxx (assigned by LIC)	0	0	PCI-X IOA card	-P1-C6(64 bit)

Converting the loop number to RIO/HSL/12X port location labels

Use the following table to convert the RIO/HSL/12X loop number to port location labels.

Note: If you are working on a Model MMA with multiple processor enclosures, exchange the FRU on the correct unit (primary or secondary) by matching the serial number (if available in the FRU list on the serviceable event view) or by matching the loop number to the correct unit.

Note: To simplify this information, secondary units on the Model MMA server are numbered 1 through 3-secondary unit 1 being nearest to the primary unit and secondary unit 3 being furthest.

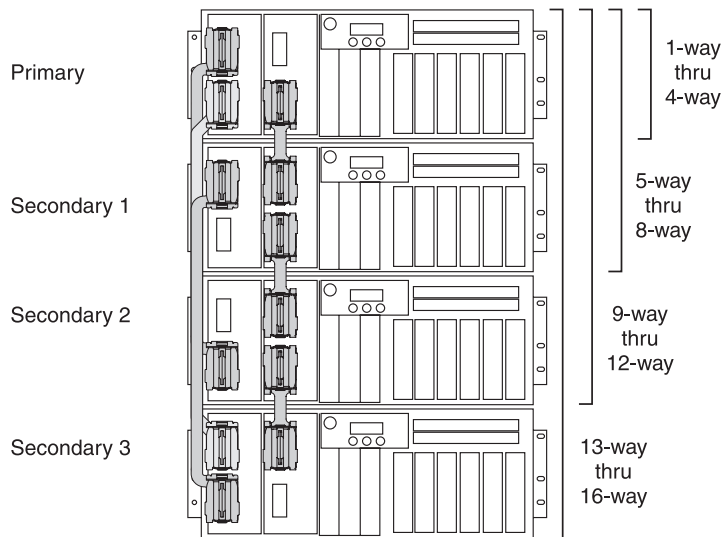


Table 11. Converting the loop number to port location labels

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
0686 / 1670	MMA primary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
0688 / 1672	MMA primary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
0696 / 1686	MMA first secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
0698 / 1688	MMA first secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
06A6 / 1702	MMA second secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
06A8 / 1704	MMA second secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
06B6 / 1718	MMA third secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
06B8 / 1720	MMA third secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
0781 / 1921	MMA primary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2

Table 11. Converting the loop number to port location labels (continued)

Loop number (hex / dec)	Model	FRU position	RIO/HSL/12X port labels on system unit or processor tower
0782 / 1922	MMA primary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
0789 / 1929	MMA first secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
078A / 1930	MMA first secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
0791 / 1937	MMA second secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
0792 / 1938	MMA second secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2
0799 / 1945	MMA third secondary unit	-P1-C8	-P1-C8-T1 -P1-C8-T2
079A / 1946	MMA third secondary unit	-P1-C9	-P1-C9-T1 -P1-C9-T2

Fiber optic cleaning procedures

Use the fiber optic cleaning kit and the fiber optic cleaning procedures in "SY27-2604 Fiber Optic Cleaning Procedures" for all fiber channel connections such as those used in optical high speed link (HSL) connections or fibre channel attached devices.

See Chapter 8, "Part Information," on page 741.

This ends the procedure.

Status indications for RIO/HSL

A status indication for a RIO/HSL loop is identified in the reference code.

Use the table below to determine if the status indication requires a service action. Record the rightmost four characters of word 4 of the reference code. These characters are the program return code (PRC), which indicates the RIO/HSL status. The leftmost four characters of word 7 indicate the RIO/HSL loop number (in hexadecimal format).

Table 12. Status indicated by the PRC

PRC	Indicated status
3204	<p>A RIO error was detected, indicating that a RIO link failed.</p> <ol style="list-style-type: none"> 1. To diagnose the error read through the transport manager flight recorder. 2. Check the failing link. If the link shows not to have failed, check the devices connected to either end of the link.

Table 12. Status indicated by the PRC (continued)

PRC	Indicated status
3205	<p>During IPL, LIC determined that the loop was not complete.</p> <ul style="list-style-type: none"> • This is expected if there are no I/O units on the loop. • This error can also occur when an I/O unit, shared I/O unit, or another system on the loop did not complete powering on by the time this system's LIC checked the loop for completeness. As a result, you may see this error in the serviceable event view you are working with. • When you find the same reference code logged from the same IPL against the same resource with a PRC of 3206 or 3208, the problem no longer exists. This can happen because the error was recovered when RIO/HSL hardware came on line, was properly configured, or the diagnostic code determined that there was not a problem based on the combination of machine types, features, configuration, and topology. In this case, you may close the problem entry. • In i5/OS, this error may also appear in the serviceable event view if any I/O units were removed from the loop without deleting the RIO/HSL I/O bridge resources of those units from Hardware Service Manager (HSM). The service procedure identified with the reference code that sent you here will help you determine if the loop is functioning correctly or if service is required. • This error may also be caused by a problem in a rack, frame, or unit connected to the RIO/HSL loop if the problem prevents the unit from powering on or being detected by LIC. Follow the service procedures for this reference code. When necessary, you may be directed to work on other reference codes before returning to this procedure.
3206	During normal operation an RIO/HSL loop recovered its redundant path. The loop is now complete.
3208	During normal operation an RIO/HSL I/O bridge recovered a failed link on the loop.
3209	See "Indicated status for PRC 3209" below.
3210	<p>An RIO/HSL link switched to a slower speed. The link is designed to run at a faster speed based on the link's hardware and LIC levels at both ends. If there is a FRU list in the serviceable event view, use it to complete the repair action. If not, perform the following sections of this procedure below:</p> <ol style="list-style-type: none"> 1. "Determining the RIO/HSL port label" on page 23 2. "Replacing the link's failing end point FRUs" on page 27 (replace only the "From Frame ID" end point FRU)

Indicated status for PRC 3209

Recoverable CRC (cyclical redundancy check) errors have occurred on the loop. This error requires service action. An RIO/HSL cable or connection must be exchanged. Exchange only the cable that appears in the FRU list of this reference code in this document. If you are working from the serviceable event view, then only the FRU(s) required for this error will be displayed.

Choose from the following scenarios:

- If there is a serviceable event view entry with a cable FRU listed with a loop number, enclosure/unit ID, and port label identified with the cable FRU, then perform one of the following:
 - If the cable is optical, it is possible the optical connections need cleaning. You can choose either to clean the cable connections at each end without exchanging the cable, or to exchange the cable. Use symbolic FRU "Fiber optic cleaning procedures" on page 21 for information on cleaning the connections. See Chapter 3, "Locating FRUs," on page 347 to exchange the cable.
 - If the cable is copper, examine the screws that hold the connector at the end of the cable identified in the reference code or the first cable location listed in the serviceable event view entry. It is possible to get CRC errors when the connector screws are not tight. You can choose to tighten the cable connector screws without exchanging the cable only if they are loose. Otherwise, you must exchange the cable. Refer to Chapter 3, "Locating FRUs," on page 347 to exchange the cable.
 - If neither of these actions resolves the problem, replace the FRUs in the serviceable event view one at a time. See Chapter 3, "Locating FRUs," on page 347.

This ends the procedure.

- If the serviceable event view entry does not list any cable FRUs, then exchange the failing items listed in the serviceable event view entry by following the normal service procedures for those FRUs. This will be the case when the RIO/HSL connection is embedded. See Chapter 3, “Locating FRUs,” on page 347.

This ends the procedure.

- If the serviceable event view entry has cable FRU(s) listed, but the loop number, enclosure/unit ID, and port label are not all listed with the cable FRU, go to “Determining the RIO/HSL port label” below.

Determining the RIO/HSL port label

Retrieve and record the following information:

- **Loop number.** The loop number is displayed in hexadecimal format as the four leftmost digits of word 7 in the reference code. Convert the loop number to decimal format using “DSA translation” on page 11. Record both the hexadecimal and decimal formats of the loop number. If the loop is an internal loop on a 515, 520, 525, or 570 (loops 0680, 0683, 0686, 0689 hexadecimal or 1664, 1667, 1670, 1673 decimal), then record “Internal”.
- **Frame ID.** The frame ID is displayed in hexadecimal format as the four leftmost digits of word 5 of the reference code. You must convert the frame ID to decimal format to match what is displayed in user interfaces and problem views. Record both the hexadecimal and decimal formats of the frame ID. If the frame ID is not zero, then translate the frame ID into the correct machine type, model, and serial number by performing the following:
 1. Log on to SST/DST.
Attention: Do not IPL to DST.
 2. Select **Hardware Service Manager**.
 3. Select **Packaging resources**.
 4. Selecting **Display details** for each unit listed until the frame ID matches the ID you are working with. Once you find the matching frame ID, record the unit’s machine type, model, and serial number.

Note: The frame has an ID of 0000 at this point in the procedure. A frame ID of zero is indicating the NIC/RIO controller in a system unit.

- **Port number indicator.** The port number indicator is the four rightmost digits of word 5 of the reference code.

Use the frame ID and port number indicator in the following table to determine the RIO/HSL port label. If you are referred to “Converting the loop number to RIO/HSL/12X port location labels” on page 19, the failing item is in a system unit. You will need the RIO/HSL loop number to determine the FRU.

The following tables provide hub, port, and location code information for each of the currently supported models. This data is used to determine which RIO loop to use for the B7006981. The asterisk in the “Port indicator number” column indicates the leading port of the port pair.

Table 13. Determining which RIO/HSL port label to use on a 515, 520, 525, and 550

Model number	Loop number	Hub	Port indicator number	Location code
515, 520, and 525	1668	0	0*	"Internal"
			1	"Internal"
	1669		2*	P1-T4
			3	P1-T3

Table 13. Determining which RIO/HSL port label to use on a 515, 520, 525, and 550 (continued)

Model number	Loop number	Hub	Port indicator number	Location code
550	1668	0	0*	"Internal"
			1	"Internal"
	1669		2*	P1-T12
			3	P1-T11
	1676	4	0	P1-C6-T2 (In an expansion card not-onboard)
			1	P1-C6-T1 (In an expansion card not-onboard)

Table 14. Determining which RIO/HSL port label to use on a 570

Model number	Loop number	CEC	Hub	Port indicator number	Location code
570	1668	0	0	0*	"Internal" (Top CEC)
				1	"Internal"
	1669	0	0	2*	P1-T8
				3	P1-T9
	1676	0	4	0*	P1-C7-T2
				1	P1-C7-T1
570	1684	1	8	0*	"Internal" (Second down)
				1	"Internal"
	1685	1	8	2*	P1-T8
				3	P1-T9
	1692	1	12	0	P1-C7-T2
				1	P1-C7-T1
570	1700	2	16	0*	"Internal" (Third down)
				1	"Internal"
	1701	2	16	2*	P1-T8
				3	P1-T9
	1708	2	20	0	P1-C7-T2
				1	P1-C7-T1
570	1716	3	24	0*	"Internal" (Fourth down)
				1	"Internal"
	1717	3	24	2*	P1-T8
				3	P1-T9
	1724	3	28	0	P1-C7-T2
				1	P1-C7-T1

Table 15. Determining which RIO/HSL port label to use on a 575

Model number	Loop number	Hub	Port indicator number	Location code
575	1668	0	0*	"Internal"
			1	"Internal"
	1669		2*	P1-T7
			3	P1-T8

Table 16. Determining which RIO/HSL port label to use on a 590 and 595

Model number	Loop number	Hub	Port indicator number	Location code
590 / 0595	1668	0	0*	"Internal" FSPA
			1	"Internal"
	1669	0	2*	P1-C1-T1
			3	P1-C1-T2
	1670	1	0*	"Internal" FSPB
			1	"Internal"
	1671	1	2*	P1-C3-T1
			3	P1-C3-T2
	1672	2	2*	P1-C5-T1
			3	P1-C5-T2
	1674	3	2*	P1-C6-T1
			3	P1-C6-T2
	1676	4	2*	P1-C8-T1
			3	P1-C8-T2
	1678	5	2*	P1-C9-T1
			3	P1-C9-T2
	1680	6	2*	P1-C11-T1
			3	P1-C11-T2
	1682	7	2*	P1-C13-T1
			3	P1-C13-T2

Table 16. Determining which RIO/HSL port label to use on a 590 and 595 (continued)

Model number	Loop number	Hub	Port indicator number	Location code
590 / 0595	1684	8	0*	"Internal" FSB (Second node position)
			1	"Internal"
	1685	8	2*	P1-C1-T1
			3	P1-C1-T2
	1686	9	0*	"Internal" FSPA
			1	"Internal"
	1687	9	2*	P2-C3-T1
			3	P2-C3-T1
	1688	10	2*	P2-C5-T1 (Optional card, no HSL)
			3	P2-C5-T2
	1690	11	2*	P2-C6-T1 (Required empty airflow)
			3	P2-C6-T2
	1692	12	2*	P2-C8-T1
			3	P2-C8-T2
	1694	13	2*	P2-C9-T1
			3	P2-C9-T2
	1696	14	2*	P2-C11-T1
			3	P2-C11-T2
	1698	15	2*	P2-C13-T1
			3	P2-C13-T2
590 / 0595	1700	16	2*	P3-C1-T1 (Third position)
			3	P3-C1-T2
	1702	17	2*	P3-C3-T1
			3	P3-C3-T2
	1704	18	2*	P3-C5-T1
			3	P3-C5-T2
	1706	19	2*	P3-C6-T1
			3	P3-C6-T2
	1708	20	2*	P3-C8-T1
			3	P3-C8-T2
	1710	21	2*	P3-C9-T1
			3	P3-C9-T2
	1712	22	2*	P3-C11-T1
			3	P3-C11-T2
	1714	23	2*	P3-C13-T2
			3	P3-C13-T2

Table 16. Determining which RIO/HSL port label to use on a 590 and 595 (continued)

Model number	Loop number	Hub	Port indicator number	Location code
590 / 0595	1716	24	2*	P4-C1-T1
			3	P4-C1-T2
	1718	25	2*	P4-C3-T1
			3	P4-C3-T2
	1720	26	2*	P4-C5-T1
			3	P4-C5-T2
	1722	27	2*	P4-C6-T1
			3	P4-C6-T2
	1724	28	2*	P4-C8-T1
			3	P4-C8-T2
	1726	29	2*	P4-C9-T1
			3	P4-C9-T2
	1728	30	2*	P4-C131-T1
			3	P4-C11-T2
	1730	31	2*	P4-C13-T1
			3	P4-C13-T2

Note: For 570, exchange the FRU on the correct unit (primary or secondary) by matching the serial number (if available in the FRU list on the serviceable event view) or by matching the loop number to the correct unit using “Converting the loop number to RIO/HSL/12X port location labels” on page 19.

Determining if the cable is the cause of the problem

If there is a cable attached to the failing port:

- If the cable is optical, it is possible the optical connections need cleaning. You can choose either to clean the cable connections at each end without exchanging the cable, or to exchange the cable. Use symbolic FRU “Fiber optic cleaning procedures” on page 21 for information on cleaning the connections. See Chapter 3, “Locating FRUs,” on page 347 to exchange the cable.
- If the cable is copper, examine the screws that hold the connector at the end of the cable identified in the reference code or the first cable location listed in the serviceable event view entry. It is possible to get CRC errors when the connector screws are not tight. You can choose to tighten the cable connector screws without exchanging the cable only if they are loose. Otherwise, you must exchange the cable.
- If neither of these actions resolves the problem, replace the cable. Perform “RIOIP08” on page 39 to determine the frame ID and RIO/HSL port label of the other end of the cable you will be exchanging (if you do not already know). Does this correct the problem?

Yes: This ends the procedure.

No: Continue with replacing the FRUs that the cable is connected to, starting with the FRU listed first.

Replacing the link’s failing end point FRUs

Use the following table to determine the end point FRUs on the “From Frame ID” port. Replace the FRUs one at a time.

If replacing the end point FRUs for the "From Frame ID" port does not resolve the error, use the table below to replace the end point FRUs at the other end of the cable. Perform "RIOIP08" on page 39 to determine the system or I/O unit frame ID and RIO/HSL port label of the other end of the cable (if you do not already know).

Table 17. End point FRUs

Model	Loop number (hexadecimal / decimal)	End point FRUs
515, 520, 525, 570	0680 / 1664	The loop is embedded in the system unit planar. Exchange the system unit planar.
515, 520, 525, 570	0681 / 1665	For all port number values, the loop's NIC/RIO controller is embedded in the system unit planar. Exchange the system unit planar.
570	0682 / 1666	For all port number values, the loop's NIC/RIO controller is in the NIC/RIO controller card. Exchange the NIC/RIO controller.
570	0683 / 16670686 / 16700689 / 1673	The loop is embedded in the system unit planar. Exchange the system unit planar. Note: Exchange the FRU on the correct unit (primary or secondary) by matching the serial number (if available in the FRU list on the serviceable event view) or by matching the loop number to the correct unit using "Converting the loop number to RIO/HSL/12X port location labels" on page 19.

This ends the procedure.

RIO/HSL/12X connection problems

The failing component is the RIO/HSL/12X connection

When a RIO/HSL cable is disconnected, it may result in a lost connection between the units even after the cable is reconnected.

Attention: To fix this problem, you need to cycle power on the unit with the locked RIO/HSL connection (see "Powering on and powering off an I/O expansion unit" on page 30 below). This problem does not occur with 12X cables.

Note: If question marks (???) appear at the end of the location code, then the port could not be determined. Use the location code associated with the other end of the cable. If question marks appear for both port locations, use the isolation procedures suggested in the reference code table for this SRC.

1. Choose from the following:

- If you were sent to this procedure from another symbolic FRU, locate that FRU in Table 18 on page 29 to see the description of the RIO/HSL/12X FRU. Then continue with the next step for more information about the FRU.
- If you are working with this symbolic FRU in the FRU list, the failing component is an RIO/HSL/12X connection. Diagnostic code could not determine what kind of hardware was involved. The RIO/HSL/12X hardware can be any of the following:
 - Cable
 - Embedded RIO/HSL/12X link in a FRU (a planar, for example)
 - RIO/HSL/12X interposer card

The RIO/HSL/12X link is on or between the other FRU or FRUs listed for the reference code. Continue with the next step.

Table 18. RIO/HSL symbolic FRUs

RIO/HSL FRU	Description
HSL_OPT	<p>This is an optical RIO/HSL cable.</p> <p>When exchanging optical RIO/HSL cables, use the optical cleaning kit and procedures. See “Fiber optic cleaning procedures” on page 21 for details.</p> <p>If an interposer card is called for, be sure the interposer type matches the cable type (optical or copper).</p>
HSL1	There is a standard copper RIO/HSL cable at both ends (yellow connectors).
HSL1_UN	There is a standard copper RIO/HSL cable (yellow connector) at the detecting end, and an unknown connector type at the other end.
HSL2	There is a copper HSL2/RIO-G cable at both ends (black connectors), but the length of the cable could not be sensed.
HSL2_xx	<p>There is a copper HSL2/RIO-G cable at both ends (black connectors). Use the xx value to determine the cable length from this list:</p> <ul style="list-style-type: none"> • HSL2_01 = 1 meter HSL2 cable • HSL2_03 = 3 meter HSL2 cable • HSL2_08 = 8 meter HSL2 cable • HSL2_10 = 10 meter HSL2 cable • HSL2_15 = 15 meter HSL2 cable • HSL2_17 = 1.75 meter HSL2 cable • HSL2_25 = 2.5 meter HSL2 cable
HSLH	There is a hybrid RIO/HSL to HSL2/RIO-G cable (yellow connector at one end and black connector at the other end), but the length of the cable could not be sensed.
HSL_IB	This is an 12X cable (green connectors).
HSLH_xx	<p>There is a hybrid RIO/HSL to HSL2/RIO-G cable (yellow connector at one end and black connector at the other end). Use the xx value to determine the cable length from this list:</p> <ul style="list-style-type: none"> • HSLH_06 = 6 meter HSL/RIO to HSL2/RIO-G cable • HSLH_15 = 15 meter HSL/RIO to HSL2/RIO-G cable
HSL_I	There is a RIO/HSL interposer card for HSL/RIO cables (yellow connectors), HSL2/RIO-G cables (black connectors), or optical cables. The interposer card type could not be sensed.
HSL_I2 HSL_I3 HSL_I4	<p>There is a RIO/HSL interposer card for HSL/RIO cables (yellow connectors), HSL2/RIO-G cables (black connectors), or optical cables. Use the x value to determine the interposer card type from this list:</p> <ul style="list-style-type: none"> • HSL_I2 = Copper HSL2/RIO-G interposer card for HSL2/RIO-G cable connectors (black) in the system unit backplane position C08 or C09 of machine type 9406 model 825. • HSL_I3 = Optical HSL/RIO interposer card for optical RIO/HSL cables in system unit backplane position C08 or C09 of machine type 9406 model 825. • HSL_I4 = HSL2/RIO-G interposer/riser card on a 7040-61D I/O unit in location -P1-Riser or -P2-(Riser).

2. Choose from the following options:

- If you are working from the serviceable event view, the location code or FRU description in the view will help determine the actual RIO/HSL/12X hardware to exchange. Continue with the next step.
- If you are not working from the serviceable event view, or the view does not have a location code or better FRU description, then determine the location code of other FRUs in the FRU list for the error. Then continue with the next step.

3. Use the location code and the information from the preceding table to determine the machine type, model, or unit feature involved in the error. If necessary, use the location code for other FRUs listed in the FRU list for this error to determine the failing RIO/HSL/12X connection and any related FRUs that

are part of that connection. Use Chapter 3, “Locating FRUs,” on page 347 to find links to the locations information. Refer to the *Parts Information* chapter of the Service Guide for the failing machine type/model for part number information.

Note: If you exchange all of the FRUs in the FRU list, but the problem still exists, contact your next level of support. You may be directed to exchange additional RIO/HSL/12X FRUs. “Additional RIO/HSL FRUs” has more information about RIO/HSL/12X FRUs on specific models and I/O units.

Additional RIO/HSL FRUs:

The following are RIO/HSL/12X FRUs by model and/or unit type. For the model or unit type you are working on, there may be additional RIO/HSL/12X FRUs which were not listed in the FRU list of the error. Under the direction of your next level of support, you can try exchanging the additional FRUs.

1. In the following table, locate the unit type(s) on which you are working. Exchange the indicated RIO/HSL/12X loop connections (external or embedded) or RIO/HSL/12X interposer card.
2. Did the exchange correct the error?
 - **Yes:** The FRU you just replaced was the failing item. Go to Chapter 5, “Verifying a repair,” on page 611.
This ends the procedure.
 - **No:** Call your next level of support.
This ends the procedure.

Table 19. RIO/HSL/12X cable or connections. To find locations information, refer to Chapter 3, “Locating FRUs,” on page 347 or the service guide for the I/O enclosure.

System model or unit type	Description	Location code
5094, 5096, 5294, 5296	HSL (optical) I/O bridge adapter	Un-CB1-C10
5094, 5096, 5294, 5296	HSL I/O bridge card	Un-CB1-C10
5094, 5096, 5294, 5296	HSL-2 I/O bridge adapter	Un-CB1-C10
7311-D11, 5790	RIO/HSL adapter	Un-P1-C7
0595, 5095	HSL (optical) I/O bridge adapter	Un-P1-C5
7311-D20, 0595, 5095	RIO/HSL I/O bridge adapter	Un-P1-C5
7311-D20, 0595, 5095	RIO/HSL-2 I/O bridge adapter	Un-P1-C5
7314-G30, 5796	Dual-port 12X adapter	Un-P1-C7
1519	Integrated xSeries Adapter	

Powering on and powering off an I/O expansion unit:

Follow these steps if you disconnected an RIO/HSL cable from an I/O expansion unit, and the RIO/HSL link on the unit did not recover when you reconnected the cable:

1. From the Hardware Service Manager screen, select **Packaging hardware resources**.
2. Select the frame that has just accidentally lost its RIO/HSL connection and select **Concurrent maintenance**. Then press **Enter**.
3. Select **Power off domain**.
4. After reconnecting the unit into the RIO/HSL loop, select **Power on domain**.

HSL loop configuration and status form

Use this HSL loop configuration and status form to record the status of the HSL ports in the loop.

Note: You may copy this form as necessary.

HSL loop configuration and status worksheet for system _____, Loop number _____

Table 20. HSL loop configuration and status form

HSL resource information			Leading port information		Trailing port information	
Resource type	Resource name	Frame ID	Port number (or internal)	Link status (operational or failed)	Port number (or internal)	Link status (operational or failed)

Installed features in a PCI bridge set form

Use this form to record the PCI bridge set card positions, and multi-adapter bridge function numbers.

Note: You might find it helpful to copy this form as necessary.

Table 21. Installed features in a PCI bridge set

PCI bridge set card positions	Multi-adapter bridge function number	Record if IOP or IOA is installed.
	0	
	1	
	2	
	3	
	4	
	5	
	6	
	7	

RIO/HSL/12X link status diagnosis form

Use this form to record the status of the RIO/HSL/12X links.

	Column A (starting status)		Column B	Column C (column A is failed and column B is failed)	Column D	Column E (column B is failed and column D is failed)
Resource with failing link	Port info	Port status	Port status		Port status	
First	Frame ID _____	Port _0 (or internal) _____	Port _0 (or internal) _____		Port _0 (or internal) _____	
	Card Position _____					
	Port # _____	Port _1 (or internal) _____	Port _1 (or internal) _____		Port _1 (or internal) _____	
Second	Frame ID _____	Port _0 (or internal) _____	Port _0 (or internal) _____		Port _0 (or internal) _____	
	Card Position _____					
	Port # _____	Port _1 (or internal) _____	Port _1 (or internal) _____		Port _1 (or internal) _____	

CONSL01

Use this procedure to exchange the I/O processor (IOP) for the system or partition console of i5/OS.

1. Is the system managed by an HMC?

No: Go to step 6 on page 33.

Yes: The HMC will be required for this procedure. Move to the HMC and continue with the next step only if the HMC is functional.

2. Can the customer power off the partition at this time?

Yes: Power off the partition from the operating system console or the HMC. Then, continue with the next step.

No: The IOP controlling the partition's console may be controlling other critical resources. The partition must be powered off to exchange this IOP. Perform this procedure when the customer is able to power off the partition. Then, continue with the next step.

3. Perform the following to determine the unit machine type, model, and serial number where the console IOP is located and the location of the console IOP:
 - a. From the *Navigation Area* of the HMC, select the **Management Environment**.
 - b. Select and expand the HMC environment for this HMC.
 - c. Select and expand **Server and Partition**.
 - d. Select **Server Management**.
 - e. Double-click the i5/OS partition you are working on.
 - f. Select the **Settings** tab.

- g. Record the location of the load source IOP. The unit type, model, and serial number are the first three parts of the location code and are separated by periods.
- h. Continue with the next step.
4. Record the frame type or feature by using the frame ID and system configuration listing or by locating the frame with that ID and recording the frame type or feature.
5. Perform the following to exchange the IOP in that card position:
 - a. Go to Chapter 3, "Locating FRUs," on page 347 and select the unit type and model that you recorded.
 - b. Locate the card position in the FRU locations table and use the exchange procedure that is identified.
 - c. Power on the partition.

This ends the procedure.
6. The problem is in the i5/OS partition of a system with one or more partitions that is not managed by an HMC. Use the table below to determine the location of the load source IOP and the appropriate exchange procedure.

Model	Load source IOP location	Load source IOA location	Link to locations information
MMA	-P1-C1	embedded SCSI in -P1	Chapter 3, "Locating FRUs," on page 347

This ends the procedure.

RIOIP01

Use this procedure to isolate a failure in a RIO/HSL/12X loop using i5/OS service tools.

Follow the steps in the "Main task" and you will be directed to the proper subtasks.

Note: During this procedure, you will be disconnecting and reconnecting cables. If errors concerning missing resources (such as disk units and RIO/HSL/12X failures) occur, ignore them. Missing resources will report in again when the loop reinitializes.

Main task

1. Were you sent here from a B600 xxxx reference code?

No: Continue with the next step.

Yes: Use the serviceable event view and the system service documentation to search for a B700 xxxx reference code with the same last four characters reported at approximately the same time. If you find one, perform service on that reference code first, and when you close that problem, close this one as well. If you do not find one, continue with the next step.
2. Before powering down any system unit or expansion unit, work with the customer to end all subsystems in all of the partitions using each partition's console.
3. From the partition control panel, IPL the system or partition to Dedicated Service Tools (DST).

Attention: Do not use function 21!
4. Are all system and expansion units on the loop powered on?

Yes: Go to step 6 on page 34.

No: Continue with the next step.
5. Perform the following:
 - a. Power on all system and expansion units on the loop. If a frame cannot be powered on, perform the "Cannot power on unit" on page 37 subtask below, and then continue with step 6 on page 34.
 - b. Was the RIO/HSL/12X link error cleared up when the frames were powered back on?
 - **No:** Continue with the next step.

- **Yes:** Go to Chapter 5, “Verifying a repair,” on page 611.

This ends the procedure.

6. Perform the following:
 - a. Access the Service Action Log (SAL) entry for this error; the field replaceable units (FRUs) should be listed there. Look for part numbers and descriptions for the FRUs containing the RIO/HSL/12X port for two frames. There should also be a FRU for the cable between them. The locations information for the FRUs is the location of the failed ports on the failed link.
 - b. Record the loop number from the SAL (if it is displayed there in one of the FRU descriptions) or from the first four characters of word 7 of the reference code. Go to “Converting the loop number to RIO/HSL/12X port location labels” on page 19 to determine which RIO/HSL/12X cables on the system you are working with.
Is this information in the SAL?
Yes: Continue with the next step.
No: Perform “Manually detecting the failed link” on page 38 below, and then continue with the next step of the main task.
7. Is the cable connecting the failed ports an optical cable?
No: Go to step 9.
Yes: Continue with the next step.
8. Perform the following:
 - a. Clean the RIO/HSL/12X cable connectors and ports using the fiber optic cleaning kit and the fiber optic cleaning procedures in “SY27-2604 Fiber Optic Cleaning Procedures”.
 - b. To determine if cleaning the connectors and ports solved the problem, perform “Manually detecting the failed link” on page 38 below and return to this point. Did the ports you were working on have a status of “failed”?
No: Then the problem is fixed, go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**
Yes: Continue with the next step.
9. There are now three cases to consider. Continue with the appropriate subtask of this procedure:
 - “The ports on both ends of the failed link are in different system units on the loop.”
 - “The port on one end of the failed link is in a system unit and the port on the other end is in an I/O unit” on page 35.
 - “The ports on both ends of the failed link are in an I/O unit” on page 36.

The ports on both ends of the failed link are in different system units on the loop

1. There may be failed hardware that will report a different error on the other system units. Perform the following:
 - a. Work any other RIO/HSL/12X problems in the serviceable event view on the other system units.
 - b. Perform “Manually detecting the failed link” on page 38 below and return to this point. Did the ports you were working on have a status of “failed”?
No: Then the problem is fixed, go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**
Yes: Continue with the next step.
2. Is the cable an optical RIO/HSL/12X cable?
Yes: Go to step 4 on page 35.
No: Continue with the next step.
3. Perform the following:
 - a. Verify that the cables are connected securely. For any cable that was loose, disconnect the cable at that end, wait 30 seconds, and reconnect the cable securely. If there are thumbscrews, you must tighten both thumb screws within 30 seconds of when the cable makes contact with the port.

- b. If you disconnected and reconnected the cable at either end, perform “Manually detecting the failed link” on page 38 below and return to this point. Did the ports you were working on have a status of “failed”?

No: Then the problem is fixed, go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

Yes: Continue with the next step.

4. Replace the cable between the two system unit ports on the failed link. To determine if replacing the cable resolved the problem, perform “Manually detecting the failed link” on page 38 below and return to this point. Did the ports you were working on have a status of “failed”?

No: Then the problem is fixed, go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

Yes: Continue with the next step.

5. Exchange the FRU with the RIO/HSL/12X port in one of the system units. If you are working with a serviceable event view and the RIO/HSL/12X FRUs are listed, exchange the FRU corresponding to the first RIO/HSL/12X cable port listed. Otherwise, exchange the FRU that is quickest and easiest to replace). To determine if replacing the FRU resolved the problem, perform “Manually detecting the failed link” on page 38 below and return to this point. Did the ports you were working on have a status of “failed”?

No: Then the problem is fixed, go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

Yes: Continue with the next step.

6. Exchange the remaining FRU with the RIO/HSL/12X port on the other system unit. To determine if replacing the FRU resolved the problem, perform “Manually detecting the failed link” on page 38 below and return to this point. Did the ports you were working on have a status of “failed”?

No: Then the problem is fixed, go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

Yes: Continue with the next step.

7. Use the procedure “RIO/HSL/12X connection problems” on page 28 to determine if there are any additional RIO/HSL/12X cable-related FRUs, such as interposer cards and internal ribbon cables, that may be on either unit. Did you exchange any additional RIO/HSL/12X FRUs?

No: Call your next level of support for further instruction. **This ends the procedure.**

Yes: Continue with the next step.

8. To determine if replacing the FRU resolved the problem, perform “Manually detecting the failed link” on page 38 below and return to this point. Did the ports you were working on have a status of “failed”?

No: Then the problem is fixed, go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

Yes: Call your next level of support for further instruction. **This ends the procedure.**

The port on one end of the failed link is in a system unit and the port on the other end is in an I/O unit

1. Switch the two RIO/HSL/12X cables on the I/O unit with the failed port, so that each cable is connected to the port where the other cable was previously connected. Disconnect both cables at the same time, wait 30 seconds, and then reconnect the cables one at a time.

Attention: For copper cables with thumbscrews, you must fully connect the cable and tighten the connector’s screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

2. Refresh the port status for the first failing resource by performing “Refresh the port status” on page 38 below. Then continue with the next step.
3. Is the port on the system unit that was failed now working?

No: Continue with the next step.

Yes: Exchange the RIO/HSL/12X bridge FRU in the I/O unit. Go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**

4. Switch the cables back to their original positions by disconnecting both cables at the same time, waiting 30 seconds, and then reconnecting the cables one at a time.

Attention: For copper cables with thumbscrews, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

5. Exchange the cable between the two ports on the failed link. To determine if replacing the cable resolved the problem, perform "Manually detecting the failed link" on page 38 below and return to this point. Did the ports you were working on have a status of "failed"?

No: Then the problem is fixed, go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**

Yes: Continue with the next step.

6. Use the procedure "RIO/HSL/12X connection problems" on page 28 to determine if there are any additional RIO/HSL/12X cable-related FRUs, such as interposer cards and internal ribbon cables, that may be on either unit. Did you exchange any additional RIO/HSL/12X FRUs?

No: Call your next level of support for further instruction. **This ends the procedure.**

Yes: Continue with the next step.

7. Exchange the RIO/HSL/12X FRU that contains the failing port in the system unit. To determine if replacing the FRU resolved the problem, perform "Manually detecting the failed link" on page 38 below and return to this point. Did the ports you were working on have a status of "failed"?

No: Then the problem is fixed, go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**

Yes: Continue with the next step.

8. To determine if replacing the FRU resolved the problem, perform "Manually detecting the failed link" on page 38 below and return to this point. Did the ports you were working on have a status of "failed"?

No: Then the problem is fixed, go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**

Yes: Call your next level of support for further instruction. **This ends the procedure.**

The ports on both ends of the failed link are in an I/O unit

1. Switch the two RIO/HSL/12X cables on the first (or "From") cable's I/O unit with the failed port so that each cable is connected to the port where the other cable was previously connected.

Attention: For copper cables with thumbscrews, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

2. Refresh the port status for the first failing resource by performing "Refresh the port status" on page 38 below. Then continue with the next step.
3. Is the port on the I/O unit on which you did not switch the cables now working?

No: Go to step 5

Yes: Exchange the RIO/HSL/12X I/O bridge card in the I/O unit where you just switched the cables. Then continue with the next step.

4. To determine if replacing the FRU resolved the problem, perform "Manually detecting the failed link" on page 38 and return to this point. Did the ports you were working on have a status of "failed"?

No: Then the problem is fixed, go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**

Yes: Continue with the next step.

5. Switch the cables back to their original positions.

Attention: For copper cables with thumbscrews, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

6. Switch the two RIO/HSL/12X cables on the second (or "To") I/O unit with the failed port so that each cable is connected to the port where the other cable was previously connected.

Attention: For copper cables with thumbscrews, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

7. Refresh the port status for the first failing resource by performing "Refresh the port status" on page 38. Then continue with the next step.

8. Is the port on the I/O unit on which you did not switch cables now working?

No: Go to step 10.

Yes: Refer to "SIIOADP" on page 177 and exchange the RIO/HSL/12X I/O bridge card in the I/O unit where you just switched the cables. Then continue with the next step.

9. To determine if replacing the FRU resolved the problem, perform "Manually detecting the failed link" on page 38 below and return to this point. Did the ports you were working on have a status of "failed"?

No: Then the problem is fixed, go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**

Yes: Continue with the next step.

10. Switch the cables back to their original positions.

Attention: For copper cables with thumbscrews, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

11. Exchange the RIO/HSL/12X cable between the two ports on the failed link. To determine if replacing the cable resolved the problem, perform "Manually detecting the failed link" on page 38, then return to this point.

Did the ports you were working on have a status of "failed"?

No: Then the problem is fixed, go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**

Yes: Continue with the next step.

12. Use the procedure "RIO/HSL/12X connection problems" on page 28 to determine if there are any additional RIO/HSL/12X cable-related FRUs, such as interposer cards and internal ribbon cables, that may be on either unit. Did you exchange any additional RIO/HSL/12X FRUs?

No: Call your next level of support for further instruction. **This ends the procedure.**

Yes: Continue with the next step.

13. To determine if replacing the FRU resolved the problem, perform "Manually detecting the failed link" on page 38 below and return to this point. Did the ports you were working on have a status of "failed"?

No: Then the problem is fixed, go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**

Yes: Call your next level of support for further instruction. **This ends the procedure.**

Cannot power on unit

1. Work the errors related to powering on the unit(s), and then continue with the next step. If a unit still cannot be powered on, re-cable the RIO/HSL/12X loop without the I/O units and system units that cannot be powered on, allowing the loop to be complete (no disconnected cables).

2. To determine if re-cabling the loop resolved the problem, perform "Manually detecting the failed link" below and return to this point.

Manually detecting the failed link

1. Get the loop number from the reference code if you do not already have it. The loop number is a hexadecimal number in word 7 of the reference code.
 - If you are working from the Product Activity Log (PAL®), then the loop number is the 4 leftmost characters of the DSA in word 7 (BBBB). The loop number is in hexadecimal. Convert the hexadecimal loop number to decimal format before continuing with this procedure.
 - If you are working from the Service Action Log (SAL), the loop number should be displayed in the FRU description area in decimal format.
2. Sign on to SST or DST (if you have not already done so). Select **Start a service tool** → **Hardware service manager** → **Logical hardware resources** → **High-speed link (HSL) resources**.
3. Select **Resources associated with loop** for the RIO/HSL/12X loop with the failed link. The RIO/HSL/12X bridges will be displayed under the loop.
4. Select **Display detail** for the loop with the failed link.
5. Record the name of the NIC/RIO controller resource you are starting from on the display. You will need to know this name to determine if you have followed the loop around and back to this resource.
6. If the leading port does not have a status of "failed", select **Follow leading port** until a leading port with a "failed" status is found, or the display is showing information for the starting NIC/RIO resource you recorded. Did you find a leading port with a status of "failed"?
 - No:** The loop is functioning properly. Return to the subtask that sent you here.
 - Yes:** Record the resource name at the leading port with a "failed" status, and the type, model, and serial number for the resource with the failed status. Continue with the next step.
7. Select **Follow leading port** one more time and note all the information for the resource name with a failed trailing port.
8. Select **Display system information** and note the power controlling system's type, model, and serial number (and name, if available). This info may be needed for FRU replacement at a later time.
9. Select **Cancel** twice to return to the previous screen.
10. Go to each resource name (found above) and select **Associated packaging resource(s)**. This gives the description of the failing item and the unit ID.
11. Select **Display detail** to find the part number and location associated with the possible failing item. Then return to the step that sent you here.

Refresh the port status

1. Wait one minute, and then sign on to SST or DST (if you have not already done so).
2. Select **Start a service tool** → **Hardware service manager** → **Logical hardware resources** → **High-speed link (HSL) resources**.
3. Move the cursor to the RIO/HSL/12X loop that you want to examine and select **Display detail** → **Include non-reporting resources**.
4. If the display is not already showing the ports for one of the units you are working on, then select **Follow leading port**. Continue to select **Follow leading port** until the display is showing the ports for one of the units you are working on. Note the status of the port you were working on. Select **Follow leading port** until the display is showing the ports for the other unit you are working on, and note the status of the port you were working on.
5. Select **Cancel** → **Refresh** → **Display detail** for the failing resource you are checking. Note any change in the status for the resource. Then return to the step that sent you here.

RIOIP06

Use HSM to examine the RIO/HSL/12X Loop to determine if other systems are connected to the loop.

1. Sign on to SST or DST (if you have not already done so).

2. Select **Start a service tool** → **Hardware service manager** → **Logical hardware resources** → **High-speed link (HSL) resources**.
3. Move the cursor to the RIO/HSL/12X loop that you want to examine, and select **Resources associated with loop**.
4. Search for Remote RIO/HSL/12X NICs on the loop.

Are there any Remote RIO/HSL/12X NICs on the loop?

Yes: You have determined that there **are** other systems connected to this loop. **This ends the procedure.**

No: You have determined that there are **not** any other systems connected to this loop. **This ends the procedure.**

RIOIP08

Starting with the unit ID and RIO/HSL/12X port for one end of an RIO/HSL/12X cable, determine the unit ID and port location for the other end.

1. Sign on to SST or to DST if you have not already done so.
2. Select **Start a Service Tool** → **Hardware Service Manager** → **Logical Hardware Resources** → **High Speed Link (HSL) Resources**.
3. Move the cursor to the RIO/HSL/12X loop that you want to examine, and select **Resources associated with loop** → **Include non-reporting resources**. The display that appears shows the loop resource and all the "HSL I/O Bridge" and all the "Remote HSL NIC" resources connected to the loop.
4. Perform the following for each of the HSL I/O Bridge resources listed until you are directed to do otherwise.
 - a. Move the cursor to the HSL I/O Bridge resource and select **Associated packaging resource(s)**.
 - b. Compare the unit ID on the display with the unit ID (in hexadecimal format) that you started with.
Are the unit IDs the same?

Yes: Continue with the next step.

No: Select **Cancel** to return to the Logical Hardware Associated with HSL Loops display. Repeat this for each HSL I/O Bridge under the loop, until you are directed to do otherwise.
5. Perform the following:
 - a. Select **Associated logical resource(s)**.
 - b. Move the cursor to the HSL I/O Bridge resource and select **Display detail**.
 - c. Examine the *Leading port* and *Trailing port* information. Search the display for the RIO/HSL/12X port location label that you recorded prior to starting this procedure. If the label is part of the information for the *Leading port*, then select **Follow leading port**. If the label is part of the information for the *Trailing port*, then select **Follow trailing port**.
 - d. Perform the step below that matches the function you selected in the previous step:
 - If you selected **Follow leading port**, then examine the display for the *Trailing port* information. Record, on the worksheet that you are using, the RIO/HSL/12X port location label shown on the "*Trailing port from previous resource*" line. Record this information as the "*To HSL Port Label*".
 - If you selected **Follow trailing port**, then examine the display for the *Leading port* information. Record, on the worksheet that you are using, the RIO/HSL/12X port location label on the "*Leading port to next resource*" line. Record this information as the "*To HSL Port Label*".
 - e. Record the "*Link type*" (Copper or Optical) on the worksheet that you are using in the field describing the cable type.
 - f. Select **Cancel** → **Cancel** → **Cancel** to return to the *Logical Hardware Associated With HSL Loops* display.
 - g. Record the resource name on the display.
 - h. Move the cursor to the resource with the resource name you recorded in step 5g.
 - i. Select **Associated packaging resource(s)**.

- j. Record the unit ID.
- k. Return to the procedure that sent you here. **This ends the procedure.**

RIOIP09

This procedure offers a description and service action for RIO/HSL/12X reference code B600 6982.

Note: A fiber optic cleaning kit may be required for optical RIO/HSL/12X connections.

Note: This reference code can occur on an RIO/HSL/12X loop when an I/O expansion unit on the loop is powered off for a concurrent maintenance action.

1. Is the reference code in the Service Action Log (SAL) or serviceable event view you are using?
Yes: There is a connection failure on an RIO/HSL/12X link. A B600 6984 reference code may also appear in the Product Activity Log (PAL) or error log view you are using. Both reference codes are reporting the same problem. Continue with the next step.
No: The reference code is only informational, and requires no service action. **This ends the procedure.**
2. Multiple B600 6982 errors may occur due to retry and recovery activity. Is there a B600 6985 with "xxxx 3206" in word 4 logged after all B600 6982 errors for the same RIO/HSL/12X loop in the PAL?
Yes: The recovery efforts were successful. Close all of the B600 6982 entries for the same loop in the SAL. No service is required. **This ends the procedure.**
No: Continue with the next step.
3. Is there a B600 6987 reference code in the SAL, or serviceable event view you are using, logged at about the same time?
Yes: Close this problem and work the B600 6987. **This ends the procedure.**
No: Continue with the next step.
4. Is there a B600 6981 reference code in the SAL, or serviceable event view you are using, logged at approximately the same time?
Yes: Go to step 9 on page 41.
No: Continue with the next step.
5. Perform "RIOIP06" on page 38 to determine if this loop connects to any other systems and then return here.

Note: The loop number can be found in the SAL in the description for the HSL_LNK FRU.

Is this loop connected to other systems?

Yes: Continue with the next step.

No: Go to step 9 on page 41.

6. Check for RIO/HSL/12X failures in the serviceable event views on the other systems. RIO/HSL/12X failures are indicated by entries with RIO/HSL/12X I/O bridge and Network Interface Controller (NIC) resources. Ignore B600 6982 and B600 6984 entries.
Are there RIO/HSL/12X failures on other systems?
Yes: Continue with the next step.
No: Go to step 9 on page 41.
7. Repair the problems on the other systems and return to this step. After making repairs on the other systems check the PAL of this system. Is there a B600 6985 reference code, with this loop's resource name, that was logged after the repairs you made on the other systems?
Yes: Continue with the next step.
No: Go to step 9 on page 41.
8. For the B600 6985 reference code you found, use "Status indications for RIO/HSL" on page 21 to determine if the loop is now complete.

Is the loop complete?

Yes: The problem has been resolved. Use “RIOIP01” on page 33 to verify that the loop is now working properly. **This ends the procedure.**

No: Continue with the next step.

9. The FRU list displayed in the SAL, or serviceable event view you are using, may be different from the failing item list given here. Use the FRU list in the serviceable event view if it is available.

Does the reference code appear in the serviceable event view with HSL_LNK or HSLxxxx listed as a symbolic FRU?

Yes: Perform “RIOIP01” on page 33. **This ends the procedure.**

No: Exchange the FRUs in the serviceable event view according to their part action codes. **This ends the procedure.**

RIOIP10

Use this procedure to determine if the RIO/HSL/12X loop is complete (with both primary and redundant paths functioning for each unit on the loop).

1. Is the system managed by a Hardware Management Console?

Yes: Continue with the next step

No: Go to step 3.

2. The RIO/HSL/12X loop number found in the first 4 characters of word 7 of the SRC that sent you here is in hexadecimal. Convert this number to decimal. If your loop number is greater than or equal to 0781 in hexadecimal format or 1921 in decimal format, then go to RIO/HSL/12X Topology screen, otherwise, go to View RIO Topology screen. Locate the decimal loop number's information on the HMC. Are all links in this loop operational?

Yes: The RIO/HSL/12X loop recovered. Return to the procedure that sent you here. **This ends the procedure.**

No: The RIO/HSL/12X loop did not recover. Return to the procedure that sent you here. **This ends the procedure.**

3. Does the system have an i5/OS partition?

Yes: Go to step 6

No: Continue with the next step.

4. Search in Advanced System Management Interface (ASMI) for a B700 6985 informational SRC logged after the RIO/HSL/12X SRC you are working on. Did you find a B7000 6985 SRC?

Yes: Continue with the next step.

No: The status of the RIO/HSL/12X loop is unknown. Return to the procedure that sent you here. **This ends the procedure.**

5. Compare the first half of word 7 in the B700 6985 informational log to the value that caused you to be sent to this procedure. Are the two values the same?

Yes: The RIO/HSL/12X loop recovered. Return to the procedure that sent you here. **This ends the procedure.**

No: The status of the RIO/HSL/12X loop is unknown. Return to the procedure that sent you here. **This ends the procedure.**

6. Search for a B700 6985 SRC informational log (not in the serviceable event view) logged after the RIO/HSL/12X SRC you were working on. You can find informational logs in the i5/OS Product Activity Log. Compare the first half of word 7 in the B700 6985 informational log to the value that caused you to be sent to this procedure. Are the two values the same?

Yes: Use the informational log and “Status indications for RIO/HSL” on page 21 to determine if the loop has recovered. This ends the procedure.

No: Continue with the next step.

7. Is this system in an RIO/HSL/12X loop with other systems, where any of the systems on the loop is running i5/OS Opticonnect?
No: The loop did not recover. Return to the procedure that sent you here. This ends the procedure.
Yes: Continue with the next step.
8. Use the Hardware Service Manager (HSM) in i5/OS to examine the RIO/HSL/12X loop number that caused you to be sent to this procedure.
 - a. Use SST (on an i5/OS partition in the system with the error) to start the HSM and display the logical resources for HSL loops.
 - b. Convert the hexadecimal RIO/HSL/12X loop number to decimal. Locate the decimal loop number in the HSM display and determine the status of the loop number. Is "Operational" the status of the loop number?
No: The loop did not recover. Return to the procedure that sent you here. This ends the procedure.
Yes: The loop has recovered. This ends the procedure.

RIOIP11

Use this procedure to recover from a B7xx 6982 RIO/HSL/12X failure.

1. Record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 41.
2. Did the RIO/HSL/12X loop recover?
No: Continue with the next step
Yes: Close the problem. **This ends the procedure.**
3. Work with the customer to determine if a processor enclosure or I/O enclosure on the RIO/HSL/12X loop has powered down normally.
4. Was a processor enclosure or I/O enclosure on the loop powered down normally?
No: Go to 6.
Yes: The loop remains in a failed state until all processor enclosures and I/O enclosures on the loop are powered on and functioning. Work with the customer to determine if all the powered down enclosures on the loop can be powered on. After all enclosures on the loop are powered on, continue with the next step.
5. Did the RIO/HSL/12X loop recover?
No: Continue with the next step.
Yes: Close the problem. **This ends the procedure.**
6. Search for a serviceable event with a 1xxx xxxx SRC logged at approximately the same time and with one or more FRUs in the same unit as those in the FRU list for the SRC you are currently working.
7. Did you find a serviceable event with a 1xxx xxxx SRC?
No: Go to 9
Yes: Work that problem. After you have repaired that error, the RIO/HSL/12X loop may be recovered. After you complete working that problem, return to this procedure and check to determine if correcting that problem also corrected the RIO/HSL/12X error. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 41.
8. Did the RIO/HSL/12X loop recover?
No: Continue with the next step.
Yes: Close the problem. **This ends the procedure.**
9. In the serviceable event view, search for a B700 6981 error logged at approximately the same time and on the same RIO/HSL/12X loop (the first four characters of word 7 are the same).
10. Did you find a serviceable event with a B700 6981 SRC at approximately the same time and on the same RIO/HSL/12X loop?

No: Go to 12.

Yes: Work that problem. After you have repaired that error, the RIO/HSL/12X loop may be recovered. After you complete working that problem, return to this procedure and check to determine if correcting that problem also corrected the RIO/HSL/12X error. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 41.

11. Did the RIO/HSL/12X loop recover?

No: Continue with the next step.

Yes: Close the problem. **This ends the procedure.**

12. Using the FRU list that you are working with for this SRC, exchange one FRU at a time. After you exchange each FRU, determine if the loop has recovered. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 41. After the loop recovers or after you have exchanged all the FRUs, continue with the next step. To replace a FRU, refer to Chapter 3, "Locating FRUs," on page 347.

13. Did the RIO/HSL/12X loop recover?

No: Contact your next level of support. **This ends the procedure.**

Yes: Close the problem. **This ends the procedure.**

RIOIP12

Use this procedure to recover from a B7xx 6985 RIO/HSL/12X failure.

1. Work with the customer to determine if a processor enclosure or I/O enclosure on the RIO/HSL/12X loop has powered down normally.
2. Was a processor enclosure or I/O enclosure on the loop powered down normally?

No: Go to 4.

Yes: The loop remains in a failed state until all processor enclosures and I/O enclosures on the loop are powered on and functioning. Work with the customer to determine if all the powered down enclosures on the loop can be powered on. After all processor enclosures and I/O enclosures on the loop are powered on, check to determine if the RIO/HSL/12X loop is complete. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 41.

3. Did the RIO/HSL/12X loop recover?

No: Continue with the next step.

Yes: Close the problem. **This ends the procedure.**

4. In the serviceable event view, search for a 1xxx xxxx error logged at approximately the same time and with one or more FRUs in the same enclosure as those in the FRU list for the SRC you are currently working with.

5. Did you find a serviceable event with a 1xxx xxxx error?

No: Go to 7

Yes: Work that problem. After you have repaired that error, the RIO/HSL/12X loop may be recovered. After you complete working that problem, return to this procedure and check to determine if correcting that problem also corrected the RIO/HSL/12X error. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 41.

6. Did the RIO/HSL/12X loop recover?

No: Continue with the next step.

Yes: Close the problem. **This ends the procedure.**

7. In the serviceable event view, search for a B700 6981 or B700 6986 error logged at approximately the same time and on the same RIO/HSL/12X loop (the first four characters of word 7 are the same).

8. Did you find a B700 6981 or a B700 6986 error logged at approximately the same time and on the same RIO/HSL/12X loop?
No: Go to step 10.
Yes: Work that problem. After you have repaired that error, the RIO/HSL/12X loop may be recovered. After you complete working that problem, return to this procedure and check to determine if correcting that problem also corrected the RIO/HSL/12X error. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 41.
9. Did the RIO/HSL/12X loop recover?
No: Continue with the next step.
Yes: Close the problem. **This ends the procedure.**
10. Search for a processor enclosure or I/O enclosure on the RIO/HSL/12X loop that has not powered up as expected.
11. Did you find a processor enclosure or I/O enclosure on the RIO/HSL/12X loop that has not powered up as expected?
No: Go to 13.
Yes: Go to "Cannot power on SPCN-controlled I/O expansion unit" on page 147 and work that power symptom. Use the first half of word 7 to determine the loop number for later use. After you have repaired that error, the RIO/HSL/12X loop may be recovered. After you complete working that power symptom, return to this procedure and check to determine if correcting that problem also corrected the RIO/HSL/12X error. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 41.
12. Did the RIO/HSL/12X loop recover?
No: Continue with the next step.
Yes: Close the problem. **This ends the procedure.**
13. Using the FRU list that you are working with for this SRC, exchange one FRU at a time. After you exchange each FRU, determine if the loop has recovered. To determine if the RIO/HSL/12X loop has recovered, record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC and perform "RIOIP10" on page 41. After the loop recovers or after you have exchanged all the FRUs, continue with the next step. To replace a FRU, refer to Chapter 3, "Locating FRUs," on page 347.
14. Did the RIO/HSL/12X loop recover?
No: Contact your next level of support. **This ends the procedure.**
Yes: Close the problem. **This ends the procedure.**

RIOIP56

Use this procedure to restore the RIO 12X link to optimal bandwidth.

1. Record the RIO/HSL/12X loop number in the first four characters of word 7 of this SRC. The loop number is in hexadecimal format and must be converted to decimal.
2. Is the system managed by a Hardware Management Console?
Yes: Continue with the next step.
No: Go to step 6 on page 45.
3. Perform the following from the Hardware Management Console:
 - a. Select the system you are working on.
 - b. Navigate to **Hardware (information)** and expand it.
 - c. Select **View RIO -12X Topology**.
 - d. In the current topology area, scroll until you find the data for the RIO/HSL/12X decimal loop number you identified in step 1.

Is the link width 12X?

Yes: The RIO 12X cable connection is now operating at the optimal bandwidth. No further action is required. **This ends the procedure.**

No: Continue with the next step.

4. Unplug both ends of the cable indicated in the FRU list for at least 30 seconds and then reconnect it. Refresh the **View RIO-12X Topology** view on the Hardware Management Console and verify that the width is now 12X for the decimal loop number you identified in step 1.

Is the link width 12X?

Yes: The RIO 12X cable connection is now operating at the optimal bandwidth. No further action is required. **This ends the procedure.**

No: Continue with the next step.

5. Replace the cable. Refresh the *View RIO-12X Topology* view on the Hardware Management Console and verify that the width is now 12X for the decimal loop number you identified in step 1.

Is the link width 12X?

Yes: The RIO 12X cable connection is now operating at the optimal bandwidth. No further action is required. **This ends the procedure.**

No: Continue replacing the items in the FRU list until the problem is resolved. **This ends the procedure.**

6. Unplug both ends of the cable indicated in the FRU list for at least 30 seconds and then reconnect the cable. It is not possible to concurrently verify that the RIO 12X link has been restored to optimal bandwidth. If the same SRC occurs for this RIO 12X link after the next IPL, the problem has not been resolved. Replace the cable and check for the error condition after the next IPL. Continue replacing the items in the FRU list, and perform an IPL the system each time until the problem has been resolved. **This ends the procedure.**

Multi-adapter bridge (MAB) isolation procedures

Use multi-adapter bridge (MAB) isolation procedures if there is no HMC attached to the server. If the server is connected to the HMC, use the procedures that are available on the HMC to continue FRU isolation.

“MABIP02”

Use this procedure to resolve a problem with a multi-adapter bridge.

“MABIP03”

Use this procedure to isolate a failing PCI adapter under a multi-adapter bridge.

“MABIP05”

Use this procedure to reset an IOP.

“MABIP50” on page 47

Use this procedure to isolate a failing PCI card under a multi-adapter bridge.

“MABIP51” on page 48

Use this procedure to resolve a problem with a multi-adapter bridge.

“MABIP52” on page 49

This procedure will isolate a failing PCI card from a reference code when the system or logical partition will not IPL.

“MABIP53” on page 51

Use this procedure to determine a card position when no location is given for a PCI adapter FRU.

“MABIP54” on page 54

Use this procedure to isolate the failing PCI I/O adapter card from a reference code with a Direct Select Address when the serviceable event view does not indicate a location for the PCI card.

“MABIP55” on page 56

Use this procedure to isolate a failing I/O adapter.

MABIP02

Use this procedure to resolve a problem with a multi-adapter bridge.

Perform “MABIP51” on page 48.

MABIP03

Use this procedure to isolate a failing PCI adapter under a multi-adapter bridge.

Perform “MABIP50” on page 47.

MABIP05

Use this procedure to reset an IOP.

Attention: When the IOP reset is performed, all resources controlled by the IOP will be reset. Perform this procedure only if the customer has verified that the IOP reset can be performed at this time.

1. Go to the SST/DST display in the partition which reported the problem. Use STRSST if i5/OS is running; use function 21 if STRSST does not work; or IPL the partition to DST.
2. On the Start Service Tools Sign On display, type in a user ID with service authority and password.
3. Select **Start a service tool** → **Hardware service manager** → **Logical hardware resources** → **System bus resources**.
4. Page forward until you find the IOP that you want to reset. For help in identifying the IOP from the Direct Select Address (DSA) in the reference code, see “DSA translation” on page 11.
5. Verify that the IOP are correct by matching the resource name(s) on the display with the resource name(s) in the Service Action Log (SAL) for the problem you are working on.

6. Move the cursor to the IOP that you want to reset, and select **I/O Debug** → **Reset IOP** → **IPL IOP**. **This ends the procedure.**

MABIP50

Use this procedure to isolate a failing PCI card under a multi-adapter bridge.

Attention: This procedure is for use with i5/OS only.

Go to “PCI bus isolation using AIX, Linux, or the HMC” on page 8 to isolate a PCI bus problem from AIX, Linux, or the HMC.

This procedure iterates through any IOPs under the multi-adapter bridge and any PCI cards operating without an IOP. It powers off each one, and then resets the multi-adapter bridge. This process repeats until it isolates the failing part.

1. Does the partition IPL to DST?
Yes: Go to the SST/DST display in the partition that reported the problem. If i5/OS is running, use STRSST; if STRSST does not work, use function 21. If i5/OS is not running, IPL the partition to DST. Then, continue with the next step.
No: Perform “MABIP52” on page 49. **This ends the procedure.**
2. On the Start Service Tools Sign On display, type in a user ID with QSRV authority and password.
3. Select **Start a service tool** → **Hardware service manager** → **Logical hardware resources** → **System bus resources**.
4. Page forward until you find the multi-adapter bridge where the problem was reported. For help in identifying the multi-adapter bridge from the Direct Select Address (DSA) in the reference code, see “DSA translation” on page 11. Verify that the multi-adapter bridge is the correct one by matching the resource name on the display with the resource name in the Service Action Log (SAL) for the problem that you are working on.
5. Select **Include non-reporting resources**.
6. Move the cursor to the first IOP under the multi-adapter bridge.
7. If the IOP is virtual, go to step 11. Otherwise, for each IOP that is under the multi-adapter bridge that you are working on, select **Associated packaging resource(s)** → **Display detail**.
8. Record the location of the IOP, except for virtual IOPs.
9. Select **Cancel** → **Cancel**.
10. Select **Resources associated with IOP**.
11. For each I/O adapter under the IOP, perform the following:
 - a. Select **Associated packaging resource(s)** → **Display detail**.
 - b. Record the location.

Note: There will be one IOA resource under each virtual IOP.

12. Perform the following:
 - a. Power off the frame or tower (see “Powering on and powering off” on page 641).
 - b. Remove one of the IOPs and all of its IOAs, or the one IOA resource under a virtual IOP.
 - c. Power on the frame or tower. Continue with the next step.
13. Check for the same failure that brought you to this procedure. Check the system control panel, the SAL for the partition that reported the problem, or the Work with partition status display for the partition that reported the problem.

Did the same reference code appear?

Yes: Power on the frame or tower. Then continue with the next step.

No: Go to step 15 on page 48.

14. Return to the System bus resources display showing the multi-adapter bridge and the associated resources. Is there another IOP under the multi-adapter bridge?
No: Go to step 17.
Yes: Return to step 12 on page 47.
15. If the IOP is virtual, then replace the IOA. **This ends the procedure.** Otherwise, the failing item is either the IOP or one of the I/O adapters that it controls. Reinstall the IOP and I/O adapters that you just removed. Perform “MABIP55” on page 56. If this procedure does not help you to identify a failing I/O adapter, then return here and continue with the next step in this procedure.
16. Perform the following:
 - a. Exchange the IOP that you identified in step 15.
 - b. Power on the frame or tower.Does the same reference code that sent you to this procedure occur?
No: The failing item was the IOP that you just exchanged. Reinstall all of the other IOPs and I/O adapters that you removed during this procedure. Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**
Yes: Continue with the next step.
17. The failing item is the FRU containing the multi-adapter bridge which controls this IOP, or an IOA that is not under an IOP. Perform the following:
 - a. Power off the unit that you are working on.
 - b. Exchange the FRU containing the multi-adapter bridge.
 - c. Power on the unit that you are working on.Does the same reference code that sent you to this procedure occur?
No: The failing item was the multi-adapter bridge FRU that you just exchanged. Reinstall all of the other IOPs and I/O adapters that you removed during this procedure. Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**
Yes: Contact your next level of support. **This ends the procedure.**

MABIP51

Use this procedure to resolve a problem with a multi-adapter bridge.

Attention: This procedure is for use with i5/OS only.

Go to “PCI bus isolation using AIX, Linux, or the HMC” on page 8 to isolate a PCI bus problem from AIX, Linux, or the HMC.

This procedure will determine if the multi-adapter bridge is failing when the symbolic FRU PIOCARD is in the failing item list. It will also determine if the symbolic FRU PIOCARD can be removed from the FRU list.

Use the Service Action Log (SAL) to check for other errors under the same multi-adapter bridge using the following steps:

1. Were you able to obtain a location for the PIOCARD FRU from the SAL?
No: Find the reference code in the SAL and record the Direct Select Address (DSA), which is in word 7 (see “DSA translation” on page 11). Then, continue with the next step.
Yes: Go to step 5 on page 49.
2. Record the bus number (BBBB) and the multi-adapter bridge number (C) of the DSA.
3. Go to “MABIP53” on page 51 to determine the location of the PCI I/O card in the failing item list. Then return here and continue with the next step.
4. Using the card position table for the frame or I/O tower type that you recorded in “MABIP53” on page 51, determine which of the card positions within the frame or I/O tower are controlled by the same multi-adapter bridge that is controlling the PCI I/O card for which you determined the location in step 3.

A card position is controlled by the same multi-adapter bridge if it has the same bus number and multi-adapter bridge number as the PCI I/O Card that you located in step 3 on page 48. Record the card position and the DSA from the card position table for each card position that is controlled by the same multi-adapter bridge.

5. Look in the SAL (see “Using the Service Action Log” on page 663) for other failures in the same frame that are either located in any of the card positions that you recorded in step 4 on page 48 or are listed with the PIOCARD FRU.

Are any such failures listed in the SAL?

No: Use the failing item list that you were using when you started this procedure. **This ends the procedure.**

Yes: The multi-adapter bridge is failing. Remove symbolic FRU PIOCARD from the list of failing items, as it is not the failing FRU. **This ends the procedure.**

MABIP52

This procedure will isolate a failing PCI card from a reference code when the system or logical partition will not IPL.

Attention: The remove and replace procedure of all FRUs in this procedure must be performed using “Dedicated Maintenance”.

1. Determine the PCI bridge set (multi-adapter bridge domain) by performing the following:
 - a. Record the bus number (BBBB), the multi-adapter bridge number (C) and the multi-adapter bridge function number (c) from the Direct Select Address (DSA) in word 7 of the reference code. See “DSA translation” on page 11 for help in determining these values.
 - b. Use the bus number that you recorded and the System Configuration Listing (or ask the customer) to determine what frame the bus is in.
 - c. Record the frame type where the bus is located.
 - d. The PCI bridge set is the group of card positions controlled by the same multi-adapter bridge on the bus that you recorded. Use the System Configuration Listing, the card position table for the frame type that you recorded, the bus number, and the multi-adapter bridge number to determine the PCI bridge set where the failure occurred.
 - e. Using the card position table, record the PCI bridge set card positions and multi-adapter bridge function numbers.
 - f. Examine the PCI bridge set in the frame, and record all the positions with IOP and IOA cards installed in them.
2. Perform the following:
 - a. Power off the system or partition.
 - b. Remove all the IOA cards in the PCI bridge set identified in step 1. Be sure to record the card position of each IOA so that you can reinstall it in the same position later. To determine the remove and replace procedures for the IOAs, go to Chapter 3, “Locating FRUs,” on page 347.
 - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

No: Power off the system or partition and continue with the next step.

Yes: Continue with step 4 on page 50.
3. Reinstall, in its original position, one of the IOAs and power on the system or partition. Does the reference code or failure that sent you to this procedure occur?

Yes: The IOA that you just installed is the failing FRU. Replace the IOA. **This ends the procedure.**

No:

- If a different SRC occurs, return to the Chapter 1, “Starting a Service Call,” on page 1 procedure and follow the service procedures for the new reference code. **This ends the procedure.**
 - If no SRC occurs and there are more IOAs to install, power off the partition and repeat this step.
 - If no SRC occurs and there are no more IOAs to install, the problem is intermittent; contact your next level of support. **This ends the procedure.**
4. Power off the system or partition. Determine which FRU contains the multi-adapter bridge.
 - a. Locate the card position table for the frame type that you recorded.
 - b. Using the multi-adapter bridge number that you recorded, search for the multi-adapter bridge function number “F” in the card position table to determine the card position of the multi-adapter bridge’s FRU.
 - c. Exchange the multi-adapter bridge’s FRU at the card position that you determined for it. See Chapter 3, “Locating FRUs,” on page 347 to determine the correct remove and replace procedure.
 - d. Install all IOPs and IOAs in their original positions.
 - e. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

No: Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

Yes: Call your next level of support. **This ends the procedure.**
 5. Determine the PCI bridge set (multi-adapter bridge domain) by performing the following:
 - a. Record the bus number (BBBB), the multi-adapter bridge number (C) and the multi-adapter bridge function number (c) from the Direct Select Address (DSA) in word 7 of the reference code. See “DSA translation” on page 11 for help in determining these values.
 - b. Use the bus number that you recorded and the System Configuration Listing (or ask the customer) to determine what frame the bus is in.
 - c. Record the frame type where the bus is located.
 - d. The PCI bridge set is the group of card positions controlled by the same multi-adapter bridge on the bus that you recorded. Use the System Configuration Listing, the card position table for the frame type that you recorded, the bus number, and the multi-adapter bridge number to determine the PCI bridge set where the failure occurred.
 - e. Using the card position table, record the PCI bridge set card positions and multi-adapter bridge function numbers.
 - f. Examine the PCI bridge set in the frame, and record all the positions with IOP and IOA cards installed in them.
 6. Are there any IOPs in the PCI bridge set identified in step 1?

Yes: Continue with the next step.

No: Go to step 8.
 7. Replace the IOPs and IOAs in the bridge set one at a time until the problem is resolved. Was the problem resolved?

Yes: **This ends the procedure.**

Yes: Go to step 8.
 8. Perform the following:
 - a. Power off the system or partition.
 - b. Remove all the IOA cards in the PCI bridge set identified in step 1. Be sure to record the card position of each IOA so that you can reinstall it in the same position later. To determine the remove and replace procedures for the IOAs, go to Chapter 3, “Locating FRUs,” on page 347.
 - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

Yes: Go to step 10.

No: Power off the system or partition and continue with the next step.

9. Reinstall, in its original position, one of the IOAs and power on the system or partition. Does the reference code or failure that sent you to this procedure occur?

Yes: The IOA that you just installed is the failing FRU. Replace the IOA. **This ends the procedure.**

No: Power off the system or partition. Repeat this step for another one of the IOAs that you removed. If you have reconnected all of the IOAs and the reference code or failure that sent you to this procedure does not occur, the problem is intermittent; contact your next level of support.

This ends the procedure.

10. Power off the system or partition. Determine which FRU contains the multi-adapter bridge.

- Locate the card position table for the frame type that you recorded.
- Using the multi-adapter bridge number that you recorded, search for the multi-adapter bridge function number "F" in the card position table to determine the card position of the multi-adapter bridge's FRU.

Is the multi-adapter bridge's FRU a FRU that you have already exchanged?

No: Continue with the next step.

Yes: Call your next level of support. **This ends the procedure.**

11. Perform the following:

- Exchange the multi-adapter bridge's FRU at the card position that you determined for it. See Chapter 3, "Locating FRUs," on page 347 to determine the correct remove and replace procedure.
- Install all IOPs and IOAs in their original positions.
- Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

No: Go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**

Yes: Call your next level of support. **This ends the procedure.**

MABIP53

Use this procedure to determine a card position when no location is given for a PCI adapter FRU.

Attention: This procedure is for use with i5/OS only.

Go to "PCI bus isolation using AIX, Linux, or the HMC" on page 8 to isolate a PCI bus problem from AIX, Linux, or the HMC.

This procedure uses the Direct Select Address given in the reference code because no location was given for a PCI adapter FRU.

- If you were sent to this procedure with a specific Direct Select Address (DSA), then use it. Otherwise, use the DSA in the reference code. Refer to "DSA translation" on page 11 to find the DSA in the reference code and translate it into the BBBB Cc values that you use in later steps of this procedure.
- Perform the following:
 - Record the bus number value, BBBB, in the DSA and convert it to decimal format.
 - Search for the decimal bus number in HSM or the System Configuration Listing to determine which frame or I/O unit contains the failing item. From the HSM screen select **Logical Hardware Resources > System Bus resources**. Move the cursor to a system bus object and select **Display Detail**. Do this for each bus until you find the bus on which you are working.

- c. Record the frame or unit type.
3. Record the Cc value in the DSA. Is the Cc value greater than 00?
 - No:** The multi-adapter bridge and the multi-adapter function number are not identified. Record that the multi-adapter bridge is not identified in the DSA. The card slot cannot be identified using the DSA. Go to step 8.
 - Yes:** Continue with the next step..
4. Is the right-most character of the Cc value 'F'?
 - No:** Continue with the next step.
 - Yes:** Only the multi-adapter bridge number is identified. Record the multi-adapter bridge number (the leftmost character of the Cc value) for later use. The card slot cannot be identified using the DSA. Go to step 8.
5. Are you working with a B7xx reference code?
 - No:** Go to step 7.
 - Yes:** Continue with the next step.
6. Is SST/DST available?
 - No:** Continue with the next step.
 - Yes:** Go to step 12 on page 53.
7. Use the "Card positions" on page 12 with the BBBB and Cc values that you recorded to identify the card position. Then return to the procedure, failing item, or symbolic FRU that sent you here. This ends the procedure.
8. Perform the following:
 - a. Sign onto SST or DST if you have not already done so.
 - b. Select **Start a service tool > Hardware service manager > Logical Hardware Resources > System bus resources**.
 - c. Put the bus number in the System bus(es) to work with field. Then select Include non-reporting resources and examine the display. Is there more than one multi-adapter bridge connected to the bus resource you are working with?
 - No:** Continue with the next step.
 - Yes:** Go to step 11.
9. Was there a multi-adapter bridge number identified in the Cc value of the DSA?
 - Yes:** Continue with the next step.
 - No:** From the Logical Hardware Resources on System Bus display, examine the status of all the resources under the bus, looking for a "failed" resource.
 - To examine the status of the IOAs, select **Resources associated with IOP** for each IOP under the bus.
 - To determine the card position of a failed resource, select **Associated packaging resource(s) > Display detail** and record the unit ID and part number.

Return to the procedure that sent you here. **This ends the procedure.**
10. Search for the multi-adapter bridge number that is identified in the DSA by moving the cursor to each multi-adapter bridge resource and selecting **Display detail**. Convert the *system card* value to hexadecimal (it is displayed in decimal format). The hexadecimal *system card* value is the Cc address of the multi-adapter bridge. When you find the multi-adapter bridge resource, where the multi-adapter bridge number (the leftmost character of the hexadecimal Cc value) matches the multi-adapter bridge number that you recorded from the DSA, then you have located the multi-adapter bridge identified in the DSA.
11. From the Logical Hardware Resources on System Bus display, examine the status of all the resources under the multi-adapter bridge, looking for a "failed" resource.
 - To examine the status of the IOAs, select **Resources associated with IOP** for each IOP under the multi-adapter bridge.

- To determine the card position of a failed resource, select **Associated packaging resource(s) > Display detail** and record the unit ID and part number.

Did you find any failed resources?

Yes: One of the failing resources that you located is the problem. Return to the procedure that sent you here. **This ends the procedure.**

No: Use the System Configuration Listing and "Card positions" on page 12 for the frame type that you recorded to determine which card positions may have the failing card. If you recorded that the multi-adapter bridge was identified in the leftmost character of the Cc value, then "Card positions" on page 12 will help you identify which card slots (PCI bridge set) are controlled by the multi-adapter bridge that is identified in the Cc value. If the multi-adapter bridge was not identified in the Cc value (indicated by a value of '0' in the leftmost character) then "Card positions" on page 12 will identify which card slots are controlled by the bus (BBBB) that is identified in the DSA. Return to the procedure that sent you here. **This ends the procedure.**

12. Perform the following:
 - a. Convert the hexadecimal Cc value in the DSA into a decimal value. You will be searching for the decimal value in HSM where it will be called "*System card*".
 - b. Sign on to SST or DST if you have not already done so.
 - c. Select **Start a Service Tool > Hardware Service Manager > Logical Hardware Resources > System Bus Resources**.
 - d. Search for the "System Bus" resource identified in BBBB of the DSA by moving the cursor to each system bus resource and selecting **Display detail**. Do this until you locate the bus number that matches the decimal bus number value that you recorded from the DSA. Record the resource name of the bus for later use. From the Logical Hardware Resources on System Bus display, select **Include non-reporting resources**.
13. From the Logical Hardware Resources on System Bus display, examine all of the IOP and IOA resources under the bus. Look for a "*System card*" value that matches the decimal value of the Cc that you converted to decimal in step 12. Perform the following to display the "*System card*" value for each of the IOP and IOA resources:

Note: Do not examine virtual IOP resources.

- To examine the IOP resources:
 - a. Select **Associated packaging resource(s) > Display detail**. The "*System card*" value of the IOP will be shown on the display.
 - b. If the "*System card*" value matches the decimal value of the Cc, then you have located the failing resource. Record the unit ID and part number, and then return to the procedure that sent you here. Otherwise, continue to examine all the IOP and IOA resources on the bus.
- To examine the IOA resources:
 - a. Move the cursor to an IOP or a virtual IOP resource and select **Resources associated with IOP > Associated packaging resource(s) > Display detail**. The "*System card*" value of the IOA will be shown on the display.
 - b. If the "*System card*" value matches the decimal value of the Cc, then you have located the failing resource. Record the unit ID and part number, and then return to the procedure that sent you here. Otherwise, continue to examine all the IOP and IOA resources on the bus.

Have you examined all the IOP and IOA resources under the bus?

No: Repeat this step.

Yes: Continue with the next step.

14. Did you locate a resource with a "*System card*" value that matches the decimal Cc value from step 12?

Yes: Record the unit ID and part number of the resource. Return to the procedure that sent you here. This ends the procedure.

No: You will not be able to locate the card using DST. Go to step 7 on page 52 to locate the card.

MABIP54

Use this procedure to isolate the failing PCI I/O adapter card from a reference code with a Direct Select Address when the serviceable event view does not indicate a location for the PCI card.

Attention: This procedure is for use with i5/OS only.

Go to “PCI bus isolation using AIX, Linux, or the HMC” on page 8 to isolate a PCI bus problem from AIX, Linux, or the HMC.

The removal and replacement of all FRUs in this procedure must be performed using dedicated maintenance.

1. Determine the PCI bridge set (multi-adapter bridge domain) by performing the following:
 - a. Record the bus number (BBBB), the multi-adapter bridge number (C), and the multi-adapter bridge function number (c) from the Direct Select Address (DSA) (see “Breaking down a RIO/HSL/12X or PCI bus reference code” on page 10 for help in determining these values).
 - b. Using the bus number and the System Configuration Listing, or by asking the customer, determine which unit the bus is located in and record that unit type.
 - c. The PCI bridge set is the group of card positions controlled by the same multi-adapter bridge on the bus that you recorded. Use the System Configuration Listing, the “Card positions” on page 12 table for the unit type that you recorded, the bus number, and the multi-adapter bridge number to determine in which PCI bridge set the failure occurred.
 - d. Using the card position table, record the PCI bridge set card positions, and the multi-adapter bridge function numbers.
 - e. Examine the PCI bridge set and record the information on the form for all of the positions with IOP and IOA cards installed in them.
2. Perform the following:
 - a. Power off the system or partition.
 - b. Remove all the IOAs in the PCI bridge set identified in step 1. Be sure to record the card position of each IOA so that you can reinstall it in the same position later. To determine the remove and replace procedures for the IOAs, locate the IOA card positions in Chapter 3, “Locating FRUs,” on page 347 for the frame type that you recorded.
 - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

No: Power off the system or partition. Go to step 6 on page 55.

Yes: Continue with the next step.

3. Perform the following:
 - a. Power off the system or partition.
 - b. Exchange the IOP that is indicated in the DSA. Be sure to record the card position of the IOP so that you can reinstall it in the same position later. To determine the exchange procedure for the IOP, locate the IOP's card position in Chapter 3, “Locating FRUs,” on page 347 for the frame type you recorded.
 - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

No: Power off the system or partition. Go to step 10 on page 55.

Yes: Continue with the next step.

4. Perform the following:
 - a. Power off the system or partition.
 - b. Install all of the IOAs that you removed in step 2. Be sure to install them in their original positions.
 - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

No: Perform “Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair” on page 9. **This ends the procedure.**

Yes: Continue with the next step.

5. Perform the following:
 - a. Power off the system or partition.
 - b. Remove all of the IOAs in the PCI bridge set identified in step 1. Be sure to record the card position of each IOA so that you can reinstall it in the same position later.
 - c. Remove the IOP that you exchanged and install the original IOP in its original position. Continue with the next step.
6. Perform the following:
 - a. Reinstall, in its original position, one of the IOAs that you removed.
 - b. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

No: Power off the system or partition. Repeat this step for another one of the IOAs that you removed. If you have reconnected all of the IOAs and the reference code or failure that sent you to this procedure does not occur, the problem is intermittent; contact your next level of support.

This ends the procedure.

Yes: The IOA that you just installed is the failing FRU. Continue with the next step.

7. Perform the following:
 - a. Power off the system or partition.
 - b. Replace the I/O adapter card that you last installed. Be sure to install the new I/O adapter card in the same position.
 - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

Yes: Contact your next level of support. **This ends the procedure.**

No: Continue with the next step.

8. Perform the following:
 - a. Power off the system or partition.
 - b. Reinstall, in their original positions, the remaining I/O adapter cards that you removed.
 - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

Yes: Contact your next level of support. **This ends the procedure.**

No: Continue with the next step.

9. Does a different reference code occur?

Yes: Perform Problem Analysis for the new reference code.

No: Perform “Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair” on page 9. **This ends the procedure.**

10. The problem is the multi-adapter bridge. Perform the following:
 - a. Power off the system or partition.
 - b. If you have not already done so, replace the I/O backplane in the failing enclosure.
 - c. Install the original IOP in its original position.
 - d. Install all of the other IOPs and IOAs into their original positions. Do not install the IOAs that you were instructed to remove in step 2 on page 54.
 - e. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

Yes: Contact your next level of support. **This ends the procedure.**

No: Continue with the next step.

11. Perform the following:

- a. Power off the system or partition.
- b. Install all of the IOAs that you removed in step 2 on page 54. Be sure to install them in their original positions.
- c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

Yes: Contact your next level of support. **This ends the procedure.**

No: The problem has been resolved. **This ends the procedure.**

MABIP55

Use this procedure to isolate a failing I/O adapter.

Attention: This procedure is for use with i5/OS only. Go to “PCI bus isolation using AIX, Linux, or the HMC” on page 8 to isolate a PCI bus problem from AIX, Linux, or the HMC.

1. If the system is not IPLed, will it IPL to DST?

Option

Yes

From the SAL display for the reference code, record the count. Continue with the next step.

Description

No

Perform “MABIP54” on page 54. This ends the procedure.

2. Go to the SST/DST display in the partition which reported the problem. Use STRSST if i5/OS is running; use function 21 if STRSST does not work; or IPL the partition to DST.
3. On the Start Service Tools Sign On display, type in a user ID with QSRV authority and password.
4. Select **Start a service tool > Hardware service manager > Logical hardware resources > System bus resources**.
5. Is there a resource name logged in the SAL entry?

No

Continue with the next step.

Yes

Go to step 12 on page 57

6. Do you have a location for the I/O processor?

Option	Description
No	Yes
Record the Direct Select Address (DSA), word 7 of the reference code, from the SAL display. Then continue with the next step.	Go to step 10.

7. Return to the HSM System bus resources display.
8. Locate the I/O processor by performing the following:
 - a. Select **Display detail**.
 - b. Compare the DSA with the bus, card, and board information for the IOP.

Note: The card information on the HSM display is in decimal format. You must convert the decimal card information to hexadecimal format to match the DSA format.

- c. Repeat this step until you find the IOP with the same DSA.

9. Select Cancel, and then go to step 13 on page 57.

10. Locate the I/O processor in HSM by performing the following for each IOP:

- a. Select **Associated packaging resource(s) > Display detail**.
 - b. Repeat until you find the IOP with the same location.
11. Select **Cancel > Cancel** and go to step 13.
12. Page forward until you find the multi-adapter bridge and IOP where the problem exists. Verify that the multi-adapter bridge and IOP are correct by matching the resource name(s) on the display with the resource name(s) in the SAL for the problem you are working on.
13. For the IOP you are working on, select **Resources associated with IOP** (if the I/O adapters are not already displayed).
14. If there is an IOA that is listed in any state other than *"operational"*, then perform steps 15 through 18 on page 58, starting with the disabled IOA by moving the cursor to the disabled IOA. Otherwise, move the cursor to the first IOA that is assigned to the IOP.
15. Select **Associated packaging resource(s) > Concurrent maintenance > Power off domain**. Record the unit ID of the slot you are powering off. Did the domain power off successfully?

Yes

Perform "MABIP05" on page 46 and then return here and continue with the next step.

No

Choose from the following options:

- If only one IOA was listed as failing, power down the system and replace the IOA. Re-IPL the system. If a different reference code occurred, perform problem analysis and work that reference code. If there was no reference code, go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**
- If there were multiple failed IOAs and concurrent maintenance did not work on one, then move to the next failed IOA and repeat steps 15 through 18 on page 58.
- If concurrent maintenance does not work for multiple failed IOAs, this procedure will not be able to identify a failing I/O adapter. Return to the procedure that sent you here. **This ends the procedure.**
-

16. Did the IOP reset and IPL successfully?

Yes

Check for the same failure that sent you to this procedure. Check the system control panel, the SAL for the partition that reported the problem, or the Work with partition status display for the partition that reported the problem. In the SAL, the count will increase if the reference code occurred again. Continue with the next step.

No

This procedure will not be able to identify a failing I/O adapter. Return to the procedure that sent you here. This ends the procedure.

17. Did the same reference code occur after the IOP was reset and IPL'd?

Yes

Perform the following:

1. Go to the Hardware Service Manager display.
2. Go to Packaging Hardware Resources.
3. Power on the IOA by selecting Power on domain.
4. Reassign the IOA to the IOP
5. Return to the HSL resource display, showing the IOP and associated resources.
6. Continue with the next step.

No

Go to step 19 on page 58.

18. Is there any other IOA, assigned to the IOP, that you have not already powered off and on?

Header

Move the cursor to another IOA assigned to the IOP, choosing IOAs with a status of *"unknown"* or *"disabled"* before moving on to IOAs with a status of *"operational"*. Go to step 15 on page 57.

Header

Go to step 21.

19. The failing IOA is located. Exchange the I/O adapter that you just powered off. Use the location you recorded in step 15 on page 57 to locate the IOA.

20. Power on the IOA that you just exchanged. Does the same reference code that sent you to this procedure still occur?

Yes

The IOA is not the failing item. Remove the IOA and reinstall the original IOA. Continue with the next step.

No

You have exchanged the failing IOA. Go to Chapter 5, "Verifying a repair," on page 611. This ends the procedure.

21. No failing IOAs were identified. Return to the procedure that sent you here. **This ends the procedure.**

Communication isolation procedure

This topic contains the procedure necessary to isolate a communications failure. Please read and observe the following warnings when using this procedure.

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

“COMIP01, COMPIP1”

This procedure helps you to isolate problems with the communications input/output adapter (IOA) or input/output processor (IOP).

COMIP01, COMPIP1

This procedure helps you to isolate problems with the communications input/output adapter (IOA) or input/output processor (IOP).

Please read and observe the danger notices in “Communication isolation procedure” before proceeding with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646.

2. To determine which communications hardware to test, use the SRC from the problem summary form, or problem log. For details on line description information, see the Starting a Trace section of "Work with communications trace" on page 665.
3. Perform the following:
 - a. Vary off the resources.
 - b. On the Start a Service Tool display, select **Hardware service manager** → **Logical hardware resources** → **System bus resources** → **Resources associated with IOP** for the attached IOPs in the list until you display the suspected failing hardware.
 - c. Select **Verify** on the hardware you want to test. The **Verify** option may be valid on the IOP, IOA, or port resource. When it is valid on the IOP resource, any replaceable memory will be tested. Communications IOAs are tested by using the **Verify** option on the port resource.
4. Run the IOA/IOP test(s). This may include any of the following:
 - Adapter internal test
 - Adapter wrap test (requires adapter wrap plug - available from your hardware service provider).
 - Processor internal test
 - Memory test
 - System port test

Does the IOA/IOP test(s) complete successfully?

No: The problem is in the IOA or IOP. If a verify test identified a failing memory module, replace the memory module. On multiple card combinations, exchange the IOA card before exchanging the IOP card. Exchange the failing hardware. See Chapter 3, "Locating FRUs," on page 347. **This ends the procedure.**

Yes: The IOA/IOP is good. Do NOT replace the IOA/IOP. Continue with the next step.

5. Before running tests on modems or network equipment, the remaining local hardware should be verified. Since the IOA/IOP test(s) have completed successfully, the remaining local hardware to be tested is the external cable.

Is the IOA adapter type 2838, with a UTP (unshielded twisted pair) external cable?

Yes: Continue with the next step.

No: Go to step 8.

6. Is the RJ-45 connector on the external cable correctly wired according to the EIA/TIA-568A standard? That is,

- Pins 1 and 2 using the same twisted pair,
- Pins 3 and 6 using the same twisted pair,
- Pins 4 and 5 using the same twisted pair,
- Pins 7 and 8 using the same twisted pair.

Yes: Continue with the next step.

No: Replace the external cable with correctly wired cable. **This ends the procedure.**

7. Do the Line Speed and Duplex values of the line description (DSPLINETH) match the corresponding values for the network device (router, hub or switch) port?

No: Change the Line Speed and/or Duplex value for either the line description or the network device (router, hub or switch) port. **This ends the procedure.**

Yes: Go to step 9 on page 61.

8. Is the cable wrap test option available as a *Verify* test option for the hardware you are testing?
 - **Yes:** Verify the external cable by running the cable wrap test. A wrap plug is required to perform the test. This plug is available from your hardware service provider.

Does the cable wrap test complete successfully?

Yes: Continue with the next step.

No: The problem is in the cable. Exchange the cable. **This ends the procedure.**

- **No:** The communications IOA/IOP is not the failing item. One of the following could be causing the problem.
 - External cable.
 - The network.
 - Any system or device on the network
 - The configuration of any system or device on the network.
 - Intermittent problems on the network.
 - A new SRC - perform problem analysis or ask your next level of support for assistance.

Work with the customer or your next level of support to correct the problem. **This ends the procedure.**

9. All the local hardware is good. This completes the local hardware verification. The communications IOA/IOP and/or external cable is not the failing item.

One of the following could be causing the problem:

- The network
- Any system or device on the network
- The configuration of any system or device on the network
- Intermittent problems on the network
- A new SRC - perform problem analysis or ask your next level of support for assistance

Work with the customer or your next level of support to correct the problem. **This ends the procedure.**

Intermittent isolation procedures

These procedures help you to correct an intermittent problem.

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

Use these procedures to correct an intermittent problem, if other problem analysis steps or tables sent you here. Only perform the procedures that apply to your system.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion unit where the FRU is located. See "Powering on and powering off" on page 641 before removing, exchanging, or installing a field-replaceable unit (FRU).

Use the procedure below to identify intermittent problems and the associated corrective actions.

"INTIP03" on page 64

Use this procedure to isolate problems with external noise on AC voltage lines.

"INTIP05" on page 65

Use this procedure to isolate problems with external noise on twinaxial cables.

“INTIP07” on page 65

Use this procedure to lessen the effects of electrical noise (electromagnetic interference, or EMI) on the system.

“INTIP08” on page 66

Use this procedure to ensure that the system is electrically grounded correctly.

“INTIP09” on page 67

Use this procedure to check the AC electrical power for the system.

“INTIP14” on page 69

Use this procedure to isolate problems with station protectors.

“INTIP16” on page 69

Use this procedure when you need to copy a main storage dump to give to your next level of support.

“INTIP18” on page 69

Use this procedure to determine if one or more PTFs are available to correct this specific problem.

“INTIP20” on page 69

Use this procedure to analyze system performance problems.

“INTIP24” on page 70

Use this procedure to collect data when the service processor reports a suspected intermittent problem.

INTIP03

Use this procedure to isolate problems with external noise on AC voltage lines.

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

Electrical noise on incoming ac voltage lines can cause various system failures. The most common source of electrical noise is lightning.

1. Ask the customer if an electrical storm was occurring at the time of the failure to determine if lightning could have caused the failure.

Could lightning have caused the failure?

No: Go to step 3 on page 65.

Yes: Continue with the next step.

2. Determine if lightning protection devices are installed on the incoming ac voltage lines where they enter the building. There must be a dedicated ground wire from the lightning protection devices to earth ground.

Are lightning protection devices installed?

Yes: Continue with the next step.

No: Lightning may have caused the intermittent problem. Recommend that the customer install lightning protection devices to prevent this problem from recurring. **This ends the procedure.**

3. Have an installation planning representative perform the following:
 - a. Connect a recording ac voltage monitor to the incoming ac voltage lines of the units that contain the failing devices with reference to ground.
 - b. Set the voltage monitor to start recording at a voltage slightly higher than the normal incoming ac voltage.

Does the system fail again with the same symptoms?

No: This ends the procedure.

Yes: Continue with the next step.

4. Look at the recording and see if the voltage monitor recorded any noise when the failure occurred. Did the monitor record any noise when the failure occurred?

Yes: Review with the customer what was happening external to the system when the failure occurred. This may help you to determine the source of the noise. Discuss with the customer what to do to remove the noise or to prevent it from affecting the server. **This ends the procedure.**

No: Perform the next intermittent isolation procedure listed in the *Isolation procedure* column. **This ends the procedure.**

INTIP05

Use this procedure to isolate problems with external noise on twinaxial cables.

Electrical noise on twinaxial cables that are not installed correctly may affect the twinaxial workstation I/O processor card.

Examples of this include open shields on twinaxial cables, and station protectors that are not being installed where necessary.

Check for the following on the system:

- There must be no more than 11 connector breaks in a twinaxial cable run.
- Station protectors must be installed (in pairs) where a cable enters or leaves a building.
- There can only be two station protectors for each twinaxial run.
- There is a maximum of seven devices (with addresses 0-6) for each cable run.
- There is a maximum cable length of 1524 meters (5000 feet) for each port.
- All cable runs must be ended (terminated).
- Disconnect all twinaxial cables that are not used.
- Remove any cause of electrical noise in the twinaxial cables.
- All workstations must be grounded.

This ends the procedure.

INTIP07

Use this procedure to lessen the effects of electrical noise (electromagnetic interference, or EMI) on the system.

1. Ensure that air flow cards are installed in all adapter card slots that are not used.
2. Keep all cables away from sources of electrical interference, such as ac voltage lines, fluorescent lights, arc welding equipment, and radio frequency (RF) induction heaters. These sources of electrical noise can cause the system to become powered off.
3. If you have an expansion unit, ensure that the cables that attach the system unit to the expansion unit are seated correctly.

Note: If the failures occur when people are close to the system or machines that are attached to the system, the problem may be electrostatic discharge (ESD).

4. Have an **installation planning representative** use a radio frequency (RF) field intensity meter to determine if there is an unusual amount of RF noise near the server. You also can use it to help determine the source of the noise. **This ends the procedure.**

INTIP08

Use this procedure to ensure that the system is electrically grounded correctly.

1. Have an **installation planning representative** or an electrician (when necessary), perform the following steps.
2. Power off the server and the power network branch circuits before performing this procedure.
3. Ensure the safety of personnel by making sure that all electrical wiring in the United States meets National Electrical Code requirements.
4. Check *all* system receptacles to ensure that each one is wired correctly. This includes receptacles for the server and all equipment that attaches to the server, including workstations. Do this to determine if a wire with primary voltage on it is swapped with the ground wire, causing an electrical shock hazard.
5. For each unit, check continuity from a conductive area on the frame to the ground pin on the plug. Do this at the end of the mainline ac power cable. The resistance must be 0.1 ohm or less.
6. Ground continuity must be present from each unit receptacle to an effective ground. Therefore, check the following:
 - The ac voltage receptacle for each unit must have a ground wire connected from the ground terminal on the receptacle to the ground bar in the power panel.
 - The ground bars in all branch circuit panels must be connected with an insulated ground wire to a **ground point**, which is defined as follows:
 - The nearest available metal cold water pipe, only if the pipe is effectively grounded to the earth (see *National Electric Code* Section 250-81, in the United States).
 - The nearest available steel beams in the building structure, only if the beam is effectively grounded to the earth.
 - Steel bars in the base of the building or a metal ground ring that is around the building under the surface of the earth.
 - A ground rod in the earth (see *National Electric Code* Section 250-83, in the United States).

Note: For installations in the United States only, by National Electrical Code standard, if more than one of the preceding grounding methods are used, they must be connected together electrically. See *National Electric Code* Section 250, for more information on grounding.

- The grounds of all separately derived sources (uninterruptable power supply, service entrance transformer, system power module, motor generator) must be connected to a **ground point** as defined above.
- The service entrance ground bar must connect to a **ground point** as defined above.
- All ground connections **must be tight**.
- Check continuity of the ground path for each unit that is using an ECOS tester, Model 1023-100. Check continuity at each unit receptacle, and measure to the **ground point** as defined above. The total resistance of each ground path must be 1.0 ohm or less. If you cannot meet this requirement, check for faults in the ground path.
- Conduit is sometimes used to meet wiring code requirements. If conduit is used, the branch circuits must still have a green (or green and yellow) wire for grounding as stated above.

Note: The ground bar and the neutral bar must never be connected together in branch circuit power panels.

The ground bar and the neutral bar in the power panels that make up the electrical power network for the server must be connected together. This applies to the first electrically isolating unit that is found in the path of electrical wiring from the server to the service entrance power panel. This isolating unit is sometimes referred to as a **separately derived source**. It can be an uninterruptible power supply, the system power module for the system, or the service entrance transformer. If the building has none of the above isolating units, the ground bar and the neutral bar must be connected together in the service entrance power panel.

7. Look inside all power panels to ensure the following:
 - There is a separate ground wire for each unit.
 - The green (or green and yellow) ground wires are connected only to the ground bar.
 - The ground bar inside each power panel is connected to the frame of the panel.
 - The neutral wires are connected only to the neutral bar.
 - The ground bar and the neutral bar are not connected together, except as stated in step 6 on page 66.
8. For systems with more than one unit, ensure that the ground wire for each unit is not connected from one receptacle to the next in a string. Each unit must have its own ground wire, which goes to the power source.
9. Ensure that the grounding wires are insulated with green (or green and yellow) wire at least equal in size to the phase wires. The grounding wires also should be as short as possible.
10. If extension-mainline power cables or multiple-outlet power strips are used, make sure that they must have a three-wire cable. One of the wires must be a ground conductor. The ground connector on the plug must not be removed. This applies to any extension mainline power cables or multiple-outlet power strips that are used on the server. It also applies for attaching devices such as personal computers, workstations, and modems.

Note: Check all extension-mainline power cables and multiple-outlet power strips with an ECOS tester and with power that is applied. Ensure that no wires are crossed (for example, a ground wire crossed with a wire that has voltage on it).

This ends the procedure.

INTIP09

Use this procedure to check the AC electrical power for the system.

1. Have an **installation planning representative** or an electrician (when necessary), perform the following steps.
2. Power off the server and the power network branch circuits before performing this procedure.
3. To ensure the safety of personnel, all electrical wiring in the United States must meet National Electrical Code requirements.
4. Check **ALL** system receptacles to ensure that each is wired correctly. This includes receptacles for the server and all equipment that attaches to the server, including workstations. Do this to determine if a wire with primary voltage on it has been swapped with the ground wire, causing an electrical shock hazard.
5. When three-phase voltage is used to provide power to the server, correct balancing of the load on each phase is important. The units should be connected so that all three phases are used equally.
6. The power distribution neutral must return to the "separately derived source" (uninterruptible power supply, service entrance transformer, system power module, motor generator) through an insulated wire that is the same size as the phase wire or larger.
7. The server and its attached equipment should be the only units that are connected to the power distribution network that the server gets its power.
8. The equipment that is attached to the server, such as workstations and printers, must be attached to the power distribution network for the server when possible.
9. Check all circuit breakers in the network that supply ac power to the server as follows:

- Ensure that the circuit breakers are installed tightly in the power panel and are not loose.
 - Feel the front surface of each circuit breaker to detect if it is warm. A warm circuit breaker may be caused by:
 - The circuit breaker that is not installed tightly in the power panel.
 - The contacts on the circuit breaker that is not making a good electrical connection with the contacts in the power panel.
 - A defective circuit breaker.
 - A circuit breaker of a smaller current rating than the current load which is going through it.
 - Devices on the branch circuit which are using more current than their rating.
10. Equipment that uses a large amount of current, such as: Air conditioners, copiers, and FAX machines, should not receive power from the same branch circuits as the system or its workstations. Also, the wiring that provides ac voltage for this equipment should not be placed in the same conduit as the ac voltage wiring for the server. The reason for this is that this equipment generates ac noise pulses. These pulses can get into the ac voltage for the server and cause intermittent problems.
11. Measure the ac voltage to each unit to ensure that it is in the normal range.
- Is the voltage outside the normal range?
- No:** Continue with the next step.
- Yes:** Contact the customer to have the voltage source returned to within the normal voltage range.
12. ***The remainder of this procedure is only for a server that is attached to a separately derived source.***

Some examples of separately derived sources are an uninterruptable power supply, a motor generator, a service entrance transformer, and a system power module.

The ac voltage system must meet all the requirements that are stated in this procedure and also all of the following:

Notes:

- a. The following applies to an uninterruptable power supply, but it can be used for any separately derived source.
- b. System upgrades **must not** exceed the power requirements of your derived source.

The uninterruptable power supply must be able to supply the peak repetitive current that is used by the system and the devices that attach to it. The uninterruptable power supply can be used over its maximum capacity if it has a low peak repetitive current specification, and the uninterruptable power supply is already fully loaded. Therefore, a de-rating factor for the uninterruptable power supply must be calculated to allow for the peak-repetitive current of the complete system. To help you determine the de-rating factor for an uninterruptable power supply, use the following:

Note: The peak-repetitive current is different from the "surge" current that occurs when the server is powered on.

The de-rating factor equals the crest factor multiplied by the RMS load current divided by the peak load current where the:

- Crest factor is the peak-repetitive current rating of the uninterruptable power supply that is divided by the RMS current rating of the uninterruptable power supply. If you do not know the crest factor of the uninterruptable power supply, assume that it is 1.414.
- RMS load current is the steady state RMS current of the server as determined by the power profile.
- Peak load current is the steady state peak current of the server as determined by the power profile.

For example, if the de-rating factor of the uninterruptable power supply is calculated to be 0.707, then the uninterruptable power supply must not be used more than 70.7% of its kVA-rated capacity. If the kVA rating of the uninterruptable power supply is 50 kVA, then the maximum allowable load on it is 35.35 kVA (50 kVA multiplied by 0.707).

When a three-phase separately derived source is used, correct balancing of the load as specified in step 5 on page 67 is **critical**. If the load on any one phase of an uninterruptable power supply is more than the load on the other phases, the voltage on all phases may be reduced.

13. If the system is attached to an uninterruptable power supply or motor generator, then check for the following:
 - The system and the attached equipment should be the only items that are attached to the uninterruptable power supply or motor generator. Equipment such as air conditioners, copiers, and FAX machines should not be attached to the same uninterruptable power supply, or motor generator that the system is attached.
 - The system unit console and the Electronic Customer Support modem must get ac voltage from the same uninterruptable power supply or motor generator to which the system is attached. **This ends the procedure.**

INTIP14

Use this procedure to isolate problems with station protectors.

Station protectors must be installed on all twinaxial cables that leave the building in which the server is located. This applies even if the cables go underground, through a tunnel, through a covered outside hallway, or through a skyway. Station protectors help prevent electrical noise on these cables from affecting the server.

1. Look at the Product Activity Log to determine what workstations are associated with the failure.
2. Determine if station protectors are installed on the twinaxial cables to the failing workstations.

Are station protectors installed on the twinaxial cables to the failing workstations?

Yes: Perform the next intermittent isolation procedure listed in the *Isolation procedure* column. **This ends the procedure.**

No: You may need to install station protectors on the twinaxial cables to the failing workstations. **This ends the procedure.**

INTIP16

Use this procedure when you need to copy a main storage dump to give to your next level of support.

For some problems, performing a dump of main storage helps to analyze the problem. The data on the dump is analyzed by support personnel to determine the cause of the problem and how to correct it.

1. Copy the main storage dump to tape. See "Copying a dump" on page 713.
2. Ask your next level of support to determine for assistance. **This ends the procedure.**

INTIP18

Use this procedure to determine if one or more PTFs are available to correct this specific problem.

1. Ensure that all PTFs that relate to the problem have been installed.

Note: Ensure that the latest platform LIC fix has been installed before you exchange a service processor.

2. Contact your next level of support for more information. **This ends the procedure.**

INTIP20

Use this procedure to analyze system performance problems.

1. Look in the Product Activity Log, ASM log, or HMC to determine if any hardware errors occurred at the same time that the performance problem occurred. Did any hardware problems occur at the same time that the performance problem occurred?

Yes: Perform problem analysis and correct the hardware errors. **This ends the procedure.**

No: The performance problems are not related to hardware. Continue with the next step.

2. Perform the following steps:
 - a. Ask the customer if they have asked software support for any software PTFs that relate to this problem.
 - b. Recommend that the customer install a cumulative PTF package if they have not done so in the past three months.
 - c. Inform the customer that performance could possibly be improved by having Software Support analyze the conditions.
 - d. Inform the customer that your service provider has performance tools. Contact Software Support for more information. **This ends the procedure.**

INTIP24

Use this procedure to collect data when the service processor reports a suspected intermittent problem.

It is important that you collect data for this problem so that the problem can be corrected. Use this procedure to collect the data.

There are several ways the system can display the SRC. Follow the instructions for the correct display method, defined as follows:

- If this SRC is displayed in the Product Activity Log or ASM log, then record all of the SRC data words, save all of the error log data, and contact your next level of support to submit an APAR.
- If the control panel is displaying SRC data words scrolling automatically through control panel functions 11, 12 and 13, and the control panel user interface buttons are not responding, then perform "FSPSP02" on page 223 instead of using this procedure.
- If the SRC is displayed at the control panel, and the control panel user interface buttons respond normally, then record all of the SRC words.

Do not perform an IPL until you perform a storage dump of the service processor. To get a storage dump of the service processor, perform the following:

1. Record the complete system reference code (SRC) (functions 11 through 20).
2. Perform a service processor dump. See "Performing dumps" on page 710.
3. Is a display shown on the console?
 - **Yes:** Continue with the next step.
 - **No:** The problem is not intermittent. Choose from the following options:
 - If you were sent here from another procedure, return there and follow the procedure for a problem that is not intermittent.
 - If the problem continues, replace the service processor hardware. **This ends the procedure.**
4. The problem is intermittent. Copy the IOP dump to tape. See "Performing dumps" on page 710.
5. Complete the IPL.
6. Determine if there are available program temporary fixes (PTFs) for this problem.
7. If a PTF is found, apply the PTF. Then, return here and answer the following question.

Did you find and apply a PTF for this problem?

 - **Yes: This ends the procedure.**
 - **No:** Record the following information, and contact your next level of support.
 - The complete SRC you recorded in this procedure

- The service processor dump to tape you obtained in step 4 on page 70.
- All known system symptoms:
 - How often the intermittent problem occurs
 - System environment (IPL, certain applications)
 - If necessary, other SRCs that you suspect relate to the problem
- Information needed to write an LICTR. **This ends the procedure.**

I/O processor (IOP) isolation procedures

Use these procedures to isolate a failure in the multiple function I/O card.

Please read all safety procedures before servicing the system.

Attention: Unless instructed otherwise, always power off the system or expansion tower where the field replaceable unit (FRU) is located before removing, exchanging, or installing a FRU.

Attention: Disconnecting the J15 and J16 cables will not prevent the system unit from powering on.

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

“IOPIP01” on page 74

Use this procedure to perform an IPL to dedicated service tool (DST) to determine if the same reference code occurs.

“IOPIP13” on page 77

Use this procedure to isolate problems on the interface between the I/O card and the storage devices.

“IOPIP16” on page 79

Use this procedure to isolate failing devices that are identified by FI codes FI01105, FI01106, and FI01107.

“IOPIP17” on page 82

Use this procedure to isolate problems that are associated with SCSI bus configuration errors and device task initialization failures.

“IOPIP18” on page 83

Use this procedure to isolate problems that are associated with SCSI bus configuration errors and device task initialization failures.

“IOPIP19” on page 85

You were sent to this procedure from unit reference code (URC) 9010, 9011, or 9013.

“IOPIP20” on page 85

Use this procedure to isolate the problem when two or more devices are missing from a disk array.

“IOPIP21” on page 87

Use this procedure to determine the failing disk unit when, a disk unit is not compatible with other disk units in the disk array, or when a disk unit has failed. If the URC is 9025 or 9030, the disk array is running, but it might not be protected.

“IOPIP22” on page 88

Use this procedure to gather error information and contact your next level of support.

“IOPIP23” on page 89

You were sent to this procedure from a unit reference code (URC) 9050.

“IOPIP25” on page 89

Use this procedure to isolate the problem when a device attached to the I/O card has functions that are not given support on the I/O card.

“IOPIP26” on page 90

Use this procedure to correct the problem when the I/O card recognizes that the attached disk unit must be initialized and formatted.

“IOPIP27” on page 92

I/O card cache data exists for a missing or failed device.

“IOPIP28” on page 94

You were sent to this procedure from unit reference code (URC) 9052.

“IOPIP29” on page 94

The failing item is in a migrated tower.

“IOPIP30” on page 94

Use this procedure to correct the problem when the system cannot find the required cache data for the attached disk units.

“IOPIP31” on page 97

Cache data associated with the attached devices cannot be found.

“IOPIP32” on page 99

You were sent to this procedure from unit reference code (URC) 9011.

“IOPIP33” on page 99

The I/O processor card detected a device configuration error. The configuration sectors on the device may be incompatible with the current I/O processor card.

“IOPIP34” on page 100

You were sent to this procedure from unit reference code (URC) 9027.

“IOPIP40” on page 100

Use this procedure to isolate the problem when a storage I/O adapter is connected to an incompatible or non-operational auxiliary cache I/O adapter.

“IOPIP41” on page 101

Use this procedure to correct the problem when an auxiliary cache I/O adapter is not connected to a storage I/O adapter or when an auxiliary cache I/O adapter is connected to an incompatible or non-operational storage I/O adapter.

IOPIP01

Use this procedure to perform an IPL to dedicated service tool (DST) to determine if the same reference code occurs.

If a new reference code occurs, more analysis may be possible with the new reference code. If the same reference code occurs, you are instructed to exchange the failing items.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646, before continuing with this procedure.
2. Was the IPL performed from disk (Type A or Type B)?
 - No:** Continue with the next step.
 - Yes:** Go to step 5.
3. Perform the following:
 - a. Ensure that the IPL media is the correct version and level that are needed for the system model.
 - b. Ensure that the media is not physically damaged.
 - c. Choose from the following options to clean the IPL media:
 - If it is cartridge type optical media (for example, DVD), do not attempt to clean the media.
 - If it is non-cartridge type media (for example, CD-ROM), wipe the disc in a straight line from the inner hub to the outer rim. Use a soft, lint-free cloth or lens tissue. Always handle the disc by the edges to avoid finger prints.
 - If it is tape, clean the recording head in the tape unit. Use the correct Cleaning Cartridge Kit provided by your service provider.
4. Perform a Type D IPL in **Manual** mode.

Does a system reference code (SRC) appear on the control panel?

 - **No:** Go to step 8 on page 75.
 - **Yes:** Is the SRC the same one that sent you to this procedure?
 - Yes:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. Refer to the reference code list. If the failing item list contains FI codes, see Chapter 3, “Locating FRUs,” on page 347 to help determine part numbers and location in the system. **This ends the procedure.**
 - No:** A different SRC occurred. Use the new SRC to correct the problem. See Chapter 1, “Starting a Service Call,” on page 1. **This ends the procedure.**
5. Perform an IPL to DST. See “Performing an IPL to DST” on page 695.

Does an SRC appear on the control panel?

 - No:** Continue with the next step.
 - Yes:** Go to step 10 on page 75.
6. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
 - **No:** Continue with the next step.
 - **Yes:** Select option **5**, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
 - If all of the reference codes are 0000, go to “LICIP11” on page 109 and use cause code 0002.
 - If any of the reference codes are not 0000, go to step 10 on page 75, and use the reference code that is not 0000.

- Note:** Use the characters in the *Type* column to find the correct reference code table.
7. Look at the product activity log. See “Using the product activity log” on page 76 for details.
Is an SRC logged as a result of this IPL?
Yes: Continue with the next step.
No: The problem cannot be isolated any more. Use the original SRC and exchange the failing items. Start with the highest probable cause of failure in the failing item list for this reference code. If the failing item list contains FI codes, see Chapter 3, “Locating FRUs,” on page 347 to help determine part numbers and location in the system. **This ends the procedure.**
 8. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
 - **Yes:** Continue with the next step.
 - **No:** Look at the product activity log. See “Using the product activity log” on page 76 for details.
Is an SRC logged as a result of this IPL?
Yes: Continue with the next step.
No: The problem is corrected. **This ends the procedure.**
 9. Select option **5**, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
 - If all of the reference codes are 0000, go to “LICIP11” on page 109 and use cause code 0002.
 - If any of the reference codes are not 0000, continue with the next step and use the reference code that is not 0000.

Note: Use the characters in the *Type* column to find the correct reference code table.
 10. Record the SRC.
Are the SRC and unit reference code (URC) the same ones that sent you to this procedure?
Yes: Continue with the next step.
No: Use the new SRC or reference code to correct the problem. **This ends the procedure.**
 11. Perform the following steps:
 - a. Power off the system or expansion tower. See “Powering on and powering off” on page 641.
 - b. Exchange the FRUs in the failing item list for the SRC you have now. Start with the highest probable cause of failure in the failing item column in the reference code list. Perform the remaining steps of this procedure after you exchange each FRU until you determine the failing FRU.

Note: If you exchange a disk unit, do not attempt to save customer data until instructed to do so in this procedure.
 12. Power on the system or the expansion unit.
Does an SRC appear on the control panel?
No: Continue with the next step.
Yes: Go to step 15 on page 76.
 13. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
 - **Yes:** Continue with the next step.
 - **No:** Look at the product activity log. See “Using the product activity log” on page 76 for details.
Is an SRC logged as a result of this IPL?
 - **Yes:** Continue with the next step.
 - **No:** The last FRU you exchanged was failing.

Note: Before exchanging a disk unit, you should attempt to save customer data.

This ends the procedure.

14. Select option **5**, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
 - If all of the reference codes are 0000, go to “LICIP11” on page 109 and use cause code 0002.
 - If any of the reference codes are not 0000, go to step 10 on page 75, and use the reference code that is not 0000.

Note: Use the characters in the *Type* column to find the correct reference code table.

15. Record the SRC on the Problem summary form. See “Using the product activity log” for details. Is the SRC the same one that sent you to this procedure?
 - **Yes:** The last FRU you exchanged is not the failing FRU. Go to step 11 on page 75 to continue FRU isolation.
 - **No:** Is the SRC B100 4504 or B100 4505 and have you exchanged disk unit 1 in the system unit, or are all the reference codes on the console 0000?
 - **Yes:** The last FRU you exchanged was failing. **This ends the procedure.**

Note: Before exchanging a disk unit, you should attempt to save customer data.

- **No:** Use the new SRC or reference code to correct the problem. **This ends the procedure.**

“Using the product activity log”

This procedure can help you learn how to use the Product Activity Log (PAL).

Using the product activity log

This procedure can help you learn how to use the Product Activity Log (PAL).

1. To locate a problem, find an entry in the product activity log for the symptom you are seeing.
 - a. On the command line, enter the Start System Service Tools command:
STRSST
If you cannot get to SST, select DST.

Note: Do not IPL the system or partition to get to DST.

- b. On the Start Service Tools Sign On display, type in a User ID with service authority and password.
 - c. From the System Service Tools display, select **Start a Service Tool** → **Product activity log** → **Analyze log**.
 - d. On the Select Subsystem Data display, select the option to view **All Logs**.

Note: You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

- e. Use the defaults on the Select Analysis Report Options display by pressing the Enter key.
 - f. Search the entries on the Log Analysis Report display.

Note: For example, a 6380 Tape Unit error would be identified as follows:

System Reference Code: 6380CC5F

Class: Perm

Resource Name: TAP01

2. Find an SRC from the product activity log that best matches the time and type of the problem the customer reported.

Did you find an SRC that matches the time and type of problem the customer reported?

Yes: Use the SRC information to correct the problem. **This ends the procedure.**

No: Contact your next level of support. **This ends the procedure.**

IOPIP13

Use this procedure to isolate problems on the interface between the I/O card and the storage devices.

The unit reference code (part of the SRC that sent you to this procedure) indicates the SCSI bus that has the problem:

Unit reference code (URC)	SCSI bus
3100	0
3101	1
3102	2
3103	3

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646.
2. Were you performing an IPL from removable media (IPL type D) when the error occurred?
No: Continue with the next step.
Yes: Exchange the FRUs in the failing item list for the reference code that sent you to this procedure. **This ends the procedure.**
3. Perform the following steps:
 - a. Look in the service action log (see “Using the Service Action Log” on page 663) for other errors logged at or around the same time as the 310x SRC.
 - b. If no entries appear in the service action log, use the product activity log (see “Using the product activity log” on page 76).
 - c. Use the other SRCs to correct the problem before performing an IPL.
 - d. Contact your next level of support as necessary for assistance with SCSI bus problem isolation.
 - e. If the problem is not corrected, continue with the next step.
4. Perform an IPL to DST. See “Performing an IPL to DST” on page 695. Does an SRC appear on the control panel?
No: Continue with the next step.
Yes: Go to step 7 on page 78.
5. Does one of the following displays appear on the console?
 - Disk Configuration Error Report
 - Disk Configuration Attention Report
 - Disk Configuration Warning Report
 - Display Unknown Mirrored Load-Source Status
 - Display Load-Source Failure
 - **Yes:** Continue with the next step.
 - **No:** Look at the product activity log. See “Using the product activity log” on page 76 for details. Is an SRC logged as a result of this IPL?
 - **Yes:** Continue with the next step.
 - **No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure see the failing item list for this reference code. If the failing item list contains FI codes, see the Chapter 3, “Locating FRUs,” on page 347 topic to help determine part numbers and location in the system. **This ends the procedure.**
6. Are all of the reference codes 0000? On some of the displays, you must press **F11** to display reference codes.

- **No:** Continue with the next step. Use the reference code that is not 0000.
 - **Yes:** Go to “LICIP11” on page 109 and use cause code 0002. **This ends the procedure.**
7. Is the SRC the same one that sent you to this procedure?
- Yes:** Continue with the next step.
- No:** Record the SRC. Then use the SRC description to correct the problem. **This ends the procedure.**
8. Perform the following:
- a. Power off the system or the expansion tower. See “Powering on and powering off” on page 641 for details.
 - b. Find the I/O card identified in the failing item list.
 - c. Remove the I/O card and install a new I/O card. See Chapter 4, “Removing and Replacing FRUs,” on page 357. This item has the highest probability of being the failing item.
 - d. Power on the system or the expansion tower.
- Does an SRC appear on the control panel?
- No:** Continue with the next step.
- Yes:** Go to step 12.
9. Does one of the following displays appear on the console?
- Disk Configuration Error Report
 - Disk Configuration Attention Report
 - Disk Configuration Warning Report
 - Display Unknown Mirrored Load-Source Status
 - Display Load-Source Failure
 - **Yes:** Does the Display Unknown Mirrored Load-Source Status display appear on the console?
- Note:** On some of these displays, you must press **F11** to display reference codes.
- **Yes:** Continue with the next step.
 - **No:** Are all of the reference codes 0000?
 - **No:** Go to step 12 using the reference code that is not 0000.
 - **Yes:** Go to “LICIP11” on page 109 and use cause code 0002. **This ends the procedure.**
 - **No:** Go to step 11.
10. Is the reference code the same one that sent you to this procedure?
- **No:** Either a new reference code occurred, or the reference code is 0000. There may be more than one problem. The original I/O card may be failing, but it must be installed in the system to continue problem isolation. Install the original I/O card by doing the following:
 - a. Power off the system or the expansion tower. See “Powering on and powering off” on page 641 for details.
 - b. Remove the I/O card you installed in step 8 and install the original I/O card.

Note: Do not power on the system or the expansion unit now.

A device connected to the I/O card could be the failing item. Go to “IOPIP16” on page 79, step (9) to continue isolating the problem. **This ends the procedure.**
 - **Yes:** Go to step 13 on page 79.
11. Look at the product activity log. See “Using the product activity log” on page 76 for details. Is an SRC logged as a result of this IPL?
- Yes:** Continue with the next step.
- No:** The I/O card, which you removed in step 8, is the failing item. **This ends the procedure.**
12. Is the SRC or reference code the same one that sent you to this procedure?

Yes: Continue with the next step.

No: Record the SRC. Then use the SRC description to correct the problem. **This ends the procedure.**

13. The original I/O card is not the failing item. Install the original I/O card by doing the following:
 - a. Power off the system or the expansion tower. See “Powering on and powering off” on page 641 for details.
 - b. Remove the I/O card you installed in step 8 on page 78 of this procedure and install the original I/O card.

Note: Do not power on the system or the expansion unit now.

A device connected to the I/O card could be the failing item. Go to “IOPIP16,” step (9) to continue isolating the problem. **This ends the procedure.**

IOPIP16

Use this procedure to isolate failing devices that are identified by FI codes FI01105, FI01106, and FI01107.

During this procedure, you will remove devices that are identified by the FI code, and then you will perform an IPL to determine if the symptoms of the failure have disappeared, or changed. You should not remove the load-source disk until you have shown that the other devices are not failing. Removing the load-source disk can change the symptom of failure, although it is not the failing unit.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Use the Hardware Service Manager (HSM) verify function (use DST or SST), and verify that all tape and optical units attached to the SCSI bus (identified by FI01105, FI01106, or FI01107) are operating correctly. See Chapter 5, “Verifying a repair,” on page 611 for details.

Note: Do not IPL the system to get to DST.

3. Choose from the following options:
 - If verification was successful for all tape and optical units, then go to step 5.
 - If any tape or optical device could not be verified, or if it failed verification, then exchange the failing item. See the Chapter 3, “Locating FRUs,” on page 347 and continue with the next step.
4. Use the Hardware Service Manager (HSM) verify function (use SST or DST) and verify that the exchanged item is operating correctly. See Chapter 5, “Verifying a repair,” on page 611 for details.

Was the verification successful?

No: Replace the exchanged device with the original. See Chapter 3, “Locating FRUs,” on page 347 and continue with the next step.

Yes: The newly exchanged tape or optical device was the failing item. **This ends the procedure.**

5. Perform an IPL to DST. See “Performing an IPL to DST” on page 695.

Does an SRC appear on the control panel?

No: Continue with the next step.

Yes: Go to step 8 on page 80.

6. Does one of the following displays appear on the console?
 - Disk Configuration Error Report
 - Disk Configuration Attention Report
 - Disk Configuration Warning Report
 - Display Unknown Mirrored Load-Source Status
 - Display Load-Source Failure

Note: On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

– **No:** Continue with the next step.

– **Yes:** Are all of the reference codes 0000?

No: Go to step 8, and use the reference code that is not 0000.

Yes: Go to “LICIP11” on page 109 and use cause code 0002. **This ends the procedure.**

7. Look at the Product Activity Log. See “Using the product activity log” on page 76 for details.

Is a reference code logged as a result of this IPL?

Yes: Continue with the next step.

No: You cannot continue isolating the problem. Use the original reference code and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, see Chapter 3, “Locating FRUs,” on page 347 for additional details. **This ends the procedure.**

8. Is the SRC or reference code the same one that sent you to this procedure?

Yes: Continue with the next step.

No: Record the SRC or reference code. Then, use the SRC or reference code to correct the problem. **This ends the procedure.**

9. Isolate the failing device by doing the following:

- Power off the system or the expansion unit if it is powered on. See “Powering on and powering off” on page 641.
- Go to Chapter 3, “Locating FRUs,” on page 347 to find the devices identified by FI code FI01105, FI01106, or FI01107 in the failing item list.
- Disconnect one of the devices that are identified by the FI code, other than the load-source disk unit.

Note: The tape, or optical units should be the first devices to be disconnected, if they are attached to the SCSI bus identified by FI01105, FI01106, or FI01107.

- Go to step 11.

10. Continue to isolate the possible failing items by doing the following:

- Power off the system or the expansion unit. See “Powering on and powering off” on page 641.
- Disconnect the next device that is identified by FI codes FI01105, FI01106, or FI01107 in the FRU list. See the note in step 9. Do not disconnect disk unit 1 (load-source disk) until you have disconnected all other devices and the load-source disk is the last device that is identified by these FI codes.

11. Power on the system or the expansion tower.

Does an SRC appear on the control panel?

No: Continue with the next step.

Yes: Go to step 14 on page 81.

12. Does one of the following displays appear on the console?

- Disk Configuration Error Report
- Disk Configuration Attention Report
- Disk Configuration Warning Report
- Display Unknown Mirrored Load-Source Status
- Display Load-Source Failure

Note: On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

- **Yes:** Go to step 14.
 - **No:** Look at the Product Activity Log. See “Using the product activity log” on page 76 for details. Is a reference code logged as a result of this IPL?
No: Continue with the next step.
Yes: Go to step 14.
13. You are here because the IPL completed successfully. The last device you disconnected is the failing item.
- Is the failing item a disk unit?
- No:** Exchange the failing item and reconnect the devices you disconnected previously. See the Chapter 3, “Locating FRUs,” on page 347. **This ends the procedure.**
- Yes:** Exchange the failing FRU. Before exchanging a disk drive, you should attempt to save customer data. **This ends the procedure.**
14. Is the SRC or reference code the same one that sent you to this procedure?
- Yes:** Continue with the next step.
- No:** Record the SRC or reference code on the Problem summary form. Then go to step 16.
15. The last device you disconnected is not failing.
- Have you disconnected all the devices that are identified by FI codes FI01105, FI01106, or FI01107 in the FRU list?
- No:** Leave the device disconnected and return to step 10 on page 80 to continue isolating the possible failing items.
- Yes:** Replace the device backplane or backplanes associated with the devices you removed in the earlier steps. If the device backplane does not fix the problem, then you cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, see Chapter 3, “Locating FRUs,” on page 347 for additional information. **This ends the procedure.**
16. Is the SRC B1xx 4504, and have you disconnected the load-source disk unit? (The load-source disk unit is disconnected by disconnecting disk unit 1.)
- **Yes:** Continue with the next step.
 - **No:** Does one of the following displays appear on the console, and are all reference codes 0000?
 - Disk Configuration Error Report
 - Disk Configuration Attention Report
 - Disk Configuration Warning Report
 - Display Unknown Mirrored Load-Source Status
 - Display Load-Source Failure
- Note:** On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.
- Yes:** Continue with the next step.
- No:** A new SRC or reference code occurred. Perform problem analysis and correct the problem. **This ends the procedure.**
17. The last device you disconnected may be the failing item. Exchange the last device you disconnected. See the Chapter 3, “Locating FRUs,” on page 347.
- Note:** Before exchanging a disk drive, you should attempt to save customer data.
- Was the problem corrected by exchanging the last device you disconnected?
- No:** Continue with the next step.
- Yes:** **This ends the procedure.**
18. Reconnect the devices you disconnected previously in this procedure.

19. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. Do not exchange the FRU that you exchanged in this procedure. If the failing item list contains FI codes, see Chapter 3, "Locating FRUs," on page 347 to help determine part numbers and location in the system. **This ends the procedure.**

IOPIP17

Use this procedure to isolate problems that are associated with SCSI bus configuration errors and device task initialization failures.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to "Determining if the system has logical partitions" on page 646 before continuing with this procedure.
2. Were you performing an IPL from removable media (IPL type D) when the error occurred?
 - **Yes:** Exchange the FRUs in the failing item list for the reference code that sent you to this procedure.
 - **No:** Perform an IPL to DST. See "Performing an IPL to DST" on page 695. Does an SRC appear on the control panel?
 - No:** Continue with the next step.
 - Yes:** Go to step 5.
3. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
 - **No:** Continue with the next step.
 - **Yes:** Does one of the following messages appear in the list?
 - Missing disk units in the configuration
 - Missing mirror protection disk units in the configuration
 - Device parity protected units in exposed mode.
 - **No:** Continue with the next step.
 - **Yes:** Select option **5**, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
 - If all of the reference codes are 0000, go to "LICIP11" on page 109 and use cause code 0002.
 - If any of the reference codes are not 0000, go to step 5, and use the reference code that is not 0000.

Note: Use the characters in the *Type* column to find the correct reference code table.
4. Look at the product activity log. See "Using the Service Action Log" on page 663. Is an SRC logged as a result of this IPL?
 - Yes:** Continue with the next step.
 - No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure (see the failing item list for this reference code in the (System Reference Codes)) topic. If the failing item list contains FI codes, see (Failing items) to help determine part numbers and location in the system. **This ends the procedure.**
5. Record the SRC. Is the SRC the same one that sent you to this procedure?
 - **No:** A different SRC or reference code occurred. Use the new SRC or reference code to perform problem analysis and correct the problem. **This ends the procedure.**
 - **Yes:** Determine the device unit reference code (URC) from the SRC. If the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appears on the console, the device URC is displayed under *Reference Code*. This is on the same line as the missing device. Is the device unit reference code **3020**, **3021**, **3022**, or **3023**?
 - Yes:** Continue with the next step.

No: Go to step 7.

6. A unit reference code of **3020**, **3021**, **3022**, or **3023** indicates that there is a problem on an I/O card SCSI bus. The problem can be caused by a device that is attached to the I/O card that:

- Is not supported.
- Does not match system configuration rules. For example, there are too many devices that are attached to the bus.
- Is failing.

Perform the following:

- a. Look at the characters on the control panel Data display or the Problem Summary Form for characters 9 - 16 of the top 16 character line of function 12 (word 3). Use the format BBBB-Cc-bb (BBBB = bus, Cc = card, bb = board) to determine the card slot location for the I/O card (see (Locations and addresses)).
- b. The unit reference code indicates the SCSI bus that has the problem:

URC	SCSI Bus
3020	0
3021	1
3022	2
3023	3

- c. To find the bus and device locations, see Chapter 3, "Locating FRUs," on page 347.
- d. Find the printout that shows the system configuration from the last IPL and compare it to the present system configuration.

Note: If configuration is not the problem, a device on the SCSI bus may be failing.

- e. If you need to perform isolation on the SCSI bus, go to "IOPIP16" on page 79. **This ends the procedure.**

7. The possible failing items are FI codes **FI01105** (90%) and **FI01112** (10%). Find the device unit address from the SRC (see "The System Reference Code (SRC) Format Description" on page 654). Use this information to find the physical location of the device. Record the type and model numbers to determine if the addressed I/O card supports this device. Is the device given support on your system?

- **No:** Continue with the next step.
- **Yes:** Perform the following:
 - a. Exchange the device.
 - b. Perform an IPL to DST. See "Performing an IPL to DST" on page 695.

Does this correct the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: **This ends the procedure.**

8. Perform the following steps:

- a. Remove the device.
- b. Perform an IPL to DST. See "Performing an IPL to DST" on page 695.

Does this correct the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: **This ends the procedure.**

IOPIP18

Use this procedure to isolate problems that are associated with SCSI bus configuration errors and device task initialization failures.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Perform an IPL to DST. See “Performing an IPL to DST” on page 695.

Does an SRC appear on the control panel?

- **Yes:** Go to step 5.
- **No:** Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?

Yes: Continue with the next step.

No: Go to step 4.

3. Does one of the following messages appear in the list?

- Missing disk units in the configuration
- Missing mirror protection disk units in the configuration
- Device parity protected units in exposed mode.
 - **No:** Continue with the next step.
 - **Yes:** Select option **5**, press **F11**, and then press **Enter** to display the details. Choose from the following options:
 - If all of the reference codes are 0000, go to “LICIP11” on page 109 and use cause code 0002.
 - If any of the reference codes are not 0000, go to step 5, and use the reference code that is not 0000.

Note: Use the characters in the *Type* column to find the correct reference code table.

4. Look at the product activity log (see (Log) for details).

Is an SRC logged as a result of this IPL?

Yes: Continue with the next step.

No: You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure in the failing item column in the reference code list. If the failing item list contains FI codes, see Chapter 3, “Locating FRUs,” on page 347 to help determine part numbers and location in the system. **This ends the procedure.**

5. Record the SRC.

Is the SRC the same one that sent you to this procedure?

Yes: Continue with the next step.

No: A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem. **This ends the procedure.**

6. Determine the device unit reference code (URC) from the SRC. If the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appears on the console, the device URC is displayed under *Reference Code*. This is on the same line as the missing device.

Is the device unit reference code 3020?

- **No:** Continue with the next step.
- **Yes:** A device reference code of 3020 indicates that a device is attached to the addressed I/O card. Either it is not supported, or it does not match system configuration rules. For example, there are too many devices that are attached to the bus. Perform the following steps:
 - a. Find the printout that shows the system configuration from the last IPL and compare it to the present system configuration.
 - b. Use the unit address and the physical address in the SRC to help you with this comparison.
 - c. If configuration is not the problem, a device on the SCSI bus may be failing. Use FI code FI00884 in the Chapter 3, “Locating FRUs,” on page 347 table to help find the failing device.

- d. If you need to perform isolation on the SCSI bus, go to “IOPIP16” on page 79. **This ends the procedure.**
7. The possible failing items are FI codes FI01105 (90%) and FI01112 (10%).
Find the device unit address from the SRC. Use this information to find the physical location of the device. Record the type and model numbers to determine if the addressed I/O card supports this device.
Is the device given support on your system?
- **No:** Continue with the next step.
 - **Yes:** Perform the following steps:
 - a. Exchange the device.
 - b. Perform an IPL to DST. See “Performing an IPL to DST” on page 695.Does this correct the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: This ends the procedure.
8. Perform the following steps:
 - a. Remove the device.
 - b. Perform an IPL to DST. See “Performing an IPL to DST” on page 695.Does this correct the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: This ends the procedure.

IOPIP19

You were sent to this procedure from unit reference code (URC) 9010, 9011, or 9013.

Contact your next level of support for assistance.

IOPIP20

Use this procedure to isolate the problem when two or more devices are missing from a disk array.

You were sent to this procedure from unit reference code (URC) 9020 or 9021.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646, before continuing with this procedure.
2. Access SST/DST by doing one of the following:
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Have any other I/O card or device SRCs (other than a 902F SRC) occurred at about the same time as this error?
 - **Yes:** Use the other I/O card or device SRCs to correct the problem. **This ends the procedure.**
 - **No:** Has the I/O card, or have the devices been repaired or reconfigured recently?
 - **Yes:** Continue with the next step.
 - **No:** Contact your next level of support for assistance. **This ends the procedure.**
4. Did you perform a D IPL to get to DST?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:

- a. Access the Product Activity Log and display the SRC that sent you here and view the "Additional Information" to record the formatted log information. Record all devices that are missing from the disk array. These are the array members that have both a present address of 0 and an expected address that is not 0.

Note: There might be more than one Product Activity Log entry with the same Log ID. Access any additional entries by pressing the enter key from the "Display Detail Report for Resource" screen. View the "Additional Information" for each entry to record the formatted log information.

For example: There might be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array.

- b. Continue with step 6.
5. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see "More information from hexadecimal reports" on page 671. Record all devices that are missing from the disk array. These are the array members that have both a present address of 0 and an expected address that is not 0.

Note: There might be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array. In order to interpret the hexadecimal information for these additional disk units, see "More information from hexadecimal reports" on page 671.

6. There are three possible ways to correct the problem:
 - a. Find the missing devices and install them in the correct physical locations in the system. If you can find the missing devices and want to continue with this repair option, then continue with the next step.
 - b. Stop the disk array that contains the missing devices.

Attention: Customer data might be lost.
If you want to continue with this repair option, go to step 8.
 - c. Initialize and format the remaining members of the disk array.

Attention: Customer data will be lost.
If you want to continue with this repair option, go to step 9 on page 87.
7. Perform the following:
 - a. Install the missing devices in the correct locations in the system. See Chapter 3, "Locating FRUs," on page 347.
 - b. Power on the system. See "Powering on and powering off" on page 641.

Does the IPL complete successfully?

No: You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**

Yes: This ends the procedure.

8. You have chosen to stop the disk array that contains the missing devices.

Attention: Customer data might be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST. See "Performing an IPL to DST" on page 695.
If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Select **Work with disk units**.

Did you get to DST with a Type D IPL?

Yes: Continue with the next step.

No: Select **Work with disk configuration** → **Work with device parity protection**. Then, continue with the next step.

- c. Select **Stop device parity protection**.
- d. Follow the on-line instructions to stop device parity protection.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

No: You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**

Yes: This ends the procedure.

9. You have chosen to initialize and format the remaining members of the disk array. Perform the following steps:

Attention: Customer data will be lost.

- a. If you are not already using dedicated service tools, perform an IPL to DST. See “Performing an IPL to DST” on page 695.

If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Select **Work with disk units**.

Did you get to DST with a Type D IPL?

Yes: Continue with the next step.

No: Select **Work with disk unit recovery** → **Disk unit problem recovery procedures**, and continue with the next step.

10. Select **Initialize and format disk unit**.
11. Follow the online instructions to format and initialize the disk units.
12. Perform an IPL from disk. Does the IPL complete successfully?

No: You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**

Yes: This ends the procedure.

IOPIP21

Use this procedure to determine the failing disk unit when, a disk unit is not compatible with other disk units in the disk array, or when a disk unit has failed. If the URC is 9025 or 9030, the disk array is running, but it might not be protected.

You were sent to this procedure from a unit reference code (URC) of 9025, 9030, or 9032.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Is the device location information for this SRC available in the Service Action Log (see “Using the Service Action Log” on page 663 for details)?

Yes: Exchange the disk unit.

No: Continue with the next step.

3. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
4. Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here.
 - b. Press the **F9** key for address information. This is the I/O card address.

Note: There may be more than one entry with the same Log ID. Entries with the same Log ID may be accessed by pressing the **Enter** key from the "Display Detail Report for Resource" screen.

Example: There may be a device specific SRC and/or an xxxx902F SRC entry in the Product Activity Log. The xxxx902F SRC will occur if there are more than 10 disk units in the array.

- c. Continue with the next step.
5. Perform the following steps:
 - a. Return to the SST or DST main menu.
 - b. Select **Work with disk units** → **Display disk configuration** → **Display disk configuration status**.
 - c. On the Display disk configuration status display, look for the devices attached to the I/O card that is identified in step 4 on page 87.
 - d. Find the device that has a status of "DPY/Unknown" or "DPY/Failed". This is the device that is causing the problem. Show the device address by selecting **Display Disk Unit Details** → **Display Detailed Address**. Record the device address.
 - e. See Chapter 3, "Locating FRUs," on page 347 and find the diagram of the system unit, or the expansion unit and find the following:
 - The card slot that is identified by the I/O card direct select address
 - The disk unit location that is identified by the device address

Have you determined the location of the I/O card and disk unit that is causing the problem?

Yes: Exchange the disk unit that is causing the problem. **This ends the procedure.**

No: Ask your next level of support for assistance. **This ends the procedure.**

IOPIP22

Use this procedure to gather error information and contact your next level of support.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to "Determining if the system has logical partitions" on page 646, before continuing with this procedure.
2. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). See "System Service Tools (SST)" on page 665.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See "Performing an IPL to DST" on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Did you perform a D IPL to get to DST?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here and view the "Additional Information" to record the formatted log information. Record all the information.

Note: There may be more than one Product Activity Log entry with the same Log ID. Access any additional entries by pressing the **Enter** key from the "Display Detail Report for Resource" screen. View the "Additional Information" for each entry to record the formatted log information. Example: There may be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array.
 - b. Continue with step 5 on page 89.
4. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see "More information from hexadecimal reports" on page 671. Record all the information. Then continue with the next step.


Note: There may be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array. In order to interpret the hexadecimal information for these additional disk units, see “More information from hexadecimal reports” on page 671.

5. Ask your next level of support for assistance.

Note: Your next level of support may require the error information you recorded in the previous step.
This ends the procedure.

IOPIP23

You were sent to this procedure from a unit reference code (URC) 9050.

If the failing item is in a migrated tower, use the *(Migrated Expansion Tower Problem Analysis, Repair and Parts)* manual  on the V5R1 Supplemental Manuals web site to fix the problem. Otherwise, contact your next level of support for assistance.

IOPIP25

Use this procedure to isolate the problem when a device attached to the I/O card has functions that are not given support on the I/O card.

You were sent to this procedure from URC 9008.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646, before continuing with this procedure.
2. Have any other I/O card or device SRCs occurred at about the same time as this error?
 - **Yes:** Use the other I/O card or device SRCs to correct the problem. See the (System Reference Codes). **This ends the procedure.**
 - **No:** Has the I/O card, or have the devices been repaired or reconfigured recently?
 - **Yes:** Continue with the next step.
 - **No:** Contact your next level of support for assistance. **This ends the procedure.**
3. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). “System Service Tools (SST)” on page 665.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
4. Did you perform a D IPL to get to DST?
 - **No:** Access the Product Activity Log and display the SRC that sent you here. Press the **F9** key for address information. This is the I/O card address. Then, view the “Additional Information” to record the formatted log information. Record the addresses that are not 0000 0000 for all devices listed. Continue with the next step.
 - **Yes:** Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O Card is in the format BBBB-Cc-bb:
 - BBBB = hexadecimal offsets 4C and 4D
 - Cc = hexadecimal offset 51
 - bb = hexadecimal offset 4FThe unit address of the I/O card is hexadecimal offset 18C through 18F.

A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see “More information from hexadecimal reports” on page 671. Record the addresses that are not 0000 0000 for all devices listed. Continue with the next step.

5. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
 - The card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
 - The disk unit locations that are identified by the unit addresses.

Have you determined the location of the I/O card and the devices that are causing the problem?

- **No:** Ask your next level of support for assistance. **This ends the procedure.**
- **Yes:** Have one or more devices been moved to this I/O card from another I/O card?

Yes: Continue with the next step.

No: Ask your next level of support for assistance. **This ends the procedure.**

6. Is the I/O card capable of supporting the devices attached, or is it in the correct mode to support the devices attached?

Note: For information on I/O card modes, see “Storage I/O card modes and jumpers” on page 272.

- **No:** Remove the devices from the I/O card.

Note: You can remove disk units without installing another disk unit, and the system continues to operate.

This ends the procedure.

- **Yes:** Do you want to continue using these devices with this I/O card?

Yes: Continue with the next step.

- **No:** Either change the I/O card mode or remove the devices from the I/O card. **This ends the procedure.**

7. Initialize and format the disk units by performing the following steps:

Attention: Data on the disk unit will be lost.

- a. Access SST or DST.
- b. Select **Work with disk units**.

Did you get to DST with a Type D IPL?

Yes: Continue with the next step.

No: Select **Work with disk unit recovery** → **Disk unit problem recovery procedures**. Then continue with the next step.

- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This may take 30 minutes or longer. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

IOPIP26

Use this procedure to correct the problem when the I/O card recognizes that the attached disk unit must be initialized and formatted.

You were sent to this procedure from URC 9092.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Have any other I/O card or device SRCs occurred at about the same time as this error?

- **Yes:** Use the other I/O card or device SRCs to correct the problem. **This ends the procedure.**
 - **No:** Has the I/O card, or have the devices been repaired or reconfigured recently?
Yes: Continue with the next step.
No: Contact your next level of support for assistance. **This ends the procedure.**
3. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695 for details.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 4. Did you perform a D IPL to get to DST?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here.
 - b. Press the **F9** key for address information. This is the I/O card address.
 - c. Then view the “Additional Information” to record the formatted log information.
 - d. Record the addresses that are not 0000 0000 for all devices listed.
 - e. Continue with step 6.
 5. Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O card is in the format BBBB-Cc-bb:
 - BBBB = hexadecimal offsets 4C and 4D
 - Cc = hexadecimal offset 51
 - bb = hexadecimal offset 4F

The unit address of the I/O card is hexadecimal offset 18C through 18F.
 - b. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see “More information from hexadecimal reports” on page 671. Record the addresses that are not 0000 0000 for all devices listed.
 - c. Continue with the next step.
 6. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
 - The card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
 - The disk unit locations that are identified by the unit addresses.

Have you determined the location of the I/O card and the devices that are causing the problem?

 - **No:** Ask your next level of support for assistance. **This ends the procedure.**
 - **Yes:** Have one or more devices been moved to this I/O card from another I/O card?
Yes: Continue with the next step.
No: Ask your next level of support for assistance. **This ends the procedure.**
 7. Do you want to continue using these devices with this I/O card?
 - **Yes:** Continue with the next step.
 - **No:** Remove the devices from the I/O card.

Note: You can remove disk units without installing another disk unit, and the system continues to operate.

This ends the procedure.

8. Initialize and format the disk units by performing the following steps:

Attention: Data on the disk unit will be lost.

- a. Access SST or DST.
- b. Select **Work with disk units**.

Did you get to DST with a Type D IPL?

Yes: Continue with the next step.

No: Select **Work with disk unit recovery** → **Disk unit problem recovery procedures**. Then continue with the next step.

- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This may take 30 minutes or longer. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

IOPIP27

I/O card cache data exists for a missing or failed device.

You were sent to this procedure from a unit reference code (URC) of 9051.

Note: For some storage I/O adapters, the cache card is integrated and not removable.

Having I/O card cache data for a missing or failed device might be caused by the following conditions:

- One or more disk units have failed on the I/O card.
- The cache card of the I/O card was not cleared before it was shipped as a MES to the customer. In addition, the service representative moved devices from the I/O card to a different I/O card before performing a system IPL.
- The cache card of the I/O card was not cleared before it was shipped to the customer. In addition, residual data was left in the cache card for disk units that manufacturing used to test the I/O card.
- The I/O card and cache card were moved from a different system or a different location on this system after an abnormal power off.
- One or more disk units were moved either concurrently, or they were removed after an abnormal power off.

CAUTION:

Any Function 08 power down (including from a D-IPL) is an abnormal power off.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Did you perform a D IPL to get to DST?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here.
 - b. Press the **F9** key for address information. This is the I/O card address.
 - c. Then view the “Additional Information” to record the formatted log information. Record the device types and serial numbers for those devices that show a unit address of 0000 0000.
 - d. Continue with step 5 on page 93.

4. Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O card is in the format BBBB-Cc-bb:
 - BBBB = hexadecimal offsets 4C and 4D.
 - Cc = hexadecimal offset 51
 - bb = hexadecimal offset 4FThe unit address of the I/O card is hexadecimal offset 18C through 18F.


A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see "More information from hexadecimal reports" on page 671.
 - b. Record the device types and serial numbers for those devices that show a unit address of 0000 0000.
 - c. Continue with the next step.
5. See Chapter 3, "Locating FRUs," on page 347 and find the diagram of the system unit, or the expansion unit. Find the card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
6. Choose from the following options:
 - If the devices from step 3 on page 92 of this procedure have never been installed on this system, continue with the next step.
 - If the devices are not in the current system disk configuration, go to step 9.
 - Otherwise, the devices are part of the system disk configuration; go to step 11.
7. Choose from the following options:
 - If this I/O card and cache card were moved from a different system, continue with the next step.
 - Otherwise, the cache card was shipped to the customer without first being cleared. Perform the following:
 - a. Make a note of the serial number, the customer number, and the device types and their serial numbers. These were found in step 3 on page 92.
 - b. Inform your next level of support.
 - c. Then go to step 10 to clear the cache card and correct the URC 9051 problem.
8. Install both the I/O card and the cache cards back into their original locations. Then re-IPL the system. There could be data in the cache card for devices in the disk configuration of the original system. After an IPL to DST and a normal power off on the original system, the cache card will be cleared. It is then safe to move the I/O card and the cache card to another location.
9. One or more devices that are not currently part of the system disk configuration were installed on this I/O card. Either they were removed concurrently, they were removed after an abnormal power off, or they have failed. Continue with the next step.
10. Use the Reclaim IOP cache storage procedure to clear data from the cache for the missing or failed devices as follows:
 - a. Perform an IPL to DST. See "Performing an IPL to DST" on page 695.

If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Reclaim the cache adapter card storage. See "Reclaiming IOP cache storage" on page 690.
11. Choose from the following options:
 - If this I/O card and cache card were moved from a different location on this system, go to step 8.
 - If the devices from step 3 on page 92 of this procedure are now installed on another I/O card, and they were moved there before the devices were added to the system disk configuration, go to step 7. (On an MES, the disk units are sometimes moved from one I/O card to another I/O card. This problem will result if manufacturing did not clear the cache card before shipping the MES.)
 - Otherwise, continue with the next step.

12. One or more devices that are currently part of the system disk configuration are either missing or failed, and have data in the cache card. Consider the following:
 - The problem may be because devices were moved from the I/O card concurrently, or they were removed after an abnormal power off. If this is the case, locate the devices, power off the system and install the devices on the correct I/O card.
 - If no devices were moved, look for other errors logged against the device, or against the I/O card that occurred at approximately the same time as this error. Continue the service action by using these system reference codes.

IOPIP28


You were sent to this procedure from unit reference code (URC) 9052.

If the failing item is in a migrated tower, use the *(Migrated Expansion Tower Problem Analysis, Repair and Parts)* manual on the V5R1 Supplemental Manuals web site  to fix the problem. Otherwise, contact your next level of support for assistance.

IOPIP29

The failing item is in a migrated tower.

You were sent to this procedure from URC 9012.

Perform SDIOP-PIP29 in the *(Migrated Expansion Tower Problem Analysis, Repair and Parts)* manual on the V5R1 Supplemental Manuals web site .

IOPIP30

Use this procedure to correct the problem when the system cannot find the required cache data for the attached disk units.

You were sent to this procedure from URC 9050.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Did you just exchange the storage input/output (I/O) adapter as a result of a failure?
 - No:** Continue with step 13 on page 96.
 - Yes:** Continue with the next step.
3. Are you working with a 571F/575B card set?
 - No:** Go to step 5 on page 95.
 - Yes:** Continue with the next step.
4. Remove the 571F/575B card set. Create a new card set with the following:

Note: Label all parts (both original and new) before moving them.

- The **new** replacement 571F storage IOA.
- The cache directory card from the **original** 571F storage IOA.
- The **original** 575B auxiliary cache adapter.

See “Separating the 571F/575B card set and moving the cache directory card” on page 647.

- Ensure that the SCSI cable and the battery power cable on the top edge of the storage side of the card are connected to the top edge of the auxiliary cache side of the card.
- Reinstall this card set into the system and go to step 6 on page 95.

5. Remove the I/O adapter. Install the **new** replacement storage I/O adapter with the following parts installed on it:

Note: Label all parts (both old and new) before moving them.

- The cache directory card from the **original** storage I/O adapter. On adapters with removable cache cards, the cache directory card will move with the removable cache card.
- The removable cache card from the **original** storage I/O adapter (this applies to only the 571E and some 2780 I/O adapters).

See Chapter 3, “Locating FRUs,” on page 347 for information on removing and replacing parts..

- If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see Chapter 8, “Part Information,” on page 741.
6. Did the 9050 SRC that sent you to this procedure occur on a type-D IPL?
Yes: Perform a type-D IPL and continue with the next step.
No: Continue with the next step.
 7. Has a new 9010 or 9050 SRC occurred in the Service Action Log or Product Activity Log?
No: Go to step 10.
Yes: Continue with the next step.
 8. Was the new SRC 9050?
No: Continue with the next step.
Yes: Contact your next level of support. **This ends the procedure.**
 9. The new SRC was 9010. Reclaim the cache storage. See “Reclaiming IOP cache storage” on page 690.

Note: When an auxiliary cache I/O adapter that is connected to the storage I/O adapter logs a 9055 SRC in the Product Activity Log, the reclaim does not result in lost sectors. Otherwise, the reclaim does result in lost sectors, and the system operator might want to restore data from the most recent saved tape after you complete the repair.

10. Are you working with a 571F/575B card set?
No: Go to step 12.
Yes: Continue with the next step.
11. Remove the 571F/575B card set. Create a new card set with the following:
 - The **new** 571F storage IOA
 - The cache directory card from the **new** 571F storage IOA
 - The **new** 575B auxiliary cache adapter

See “Separating the 571F/575B card set and moving the cache directory card” on page 647.

- Ensure that the SCSI cable and the battery power cable on the top edge of the storage side of the card are connected to the top edge of the auxiliary cache side of the card.
 - Reinstall this card set into the system. **This ends the procedure.**
12. Remove the I/O adapter. Install the **new** replacement storage I/O adapter that has the following parts installed on it:
 - The cache directory card from the **new** storage I/O adapter. On adapters with removable cache cards, the cache directory card will move with the removable cache card.
 - The removable cache card from the **new** storage I/O adapter (this applies to only the 571E and some 2780 I/O adapters).

See Chapter 3, “Locating FRUs,” on page 347.

- If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see Chapter 8, “Part Information,” on page 741.

This ends the procedure

13. Identify the affected disk units using information in the Product Activity Log. Access SST/DST by doing one of the following:
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
14. Did you perform a D IPL to get to DST?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here, then view *Additional Information* to record the formatted log information. The *Device Errors detected* field indicates the total number of disk units that are affected. The *Device Errors logged* field indicates the number of disk units for which detailed information is provided. Under the *Device* heading, the unit address, type, and serial number are provided for up to three disk units. Additionally, the controller type and serial number for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

Note: You might find more than one Product Activity Log entry with the same Log ID. Access any additional entries by pressing Enter from the Display Detail Report for Resource screen. View *Additional Information* for each entry, and record the formatted log information. For example: You might find an entry for an xxxx902F SRC in the Product Activity Log when the array includes more than 10 disk units.
 - b. Continue with step 16.
15. A formatted display of hexadecimal information for Product Activity Log entries is not available. To interpret the hexadecimal information, see “More information from hexadecimal reports” on page 671. The *Device Errors detected* field indicates the total number of disk units that are affected. The *Device Errors logged* field indicates the number of disk units for which detailed information is provided. Under the *Device* heading, the unit address, type, and serial number are provided for up to three disk units. Additionally, the controller type and serial number for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

Note: You might find an entry for an xxxx902F SRC entry in the Product Activity Log when the array includes more than 10 disk units. To interpret the hexadecimal information for these additional disk units, see “More information from hexadecimal reports” on page 671.
16. Has the I/O card or have the devices been repaired or reconfigured recently?
 - **Yes:** Continue with the next step.
 - **No:** Contact your next level of support for assistance. **This ends the procedure.**
17. You can use one of the following repair options to correct the problem:
 - Reunite the adapter and disk units identified in previous steps so that the cache data can be written to the disk units. If you can find the devices and adapters and want to continue with this repair option, then continue with the next step.
 - If the data for the disk units identified in previous steps is not needed on this or any other system, initialize and format these disk units.

Attention: This repair option causes a loss of customer data. If you want to continue with this repair option, go to step 19 on page 97.
18. Perform the following:

- a. Restore the adapter and disk units back to their original configuration. For more information, see Chapter 3, “Locating FRUs,” on page 347. After the system writes cache data to the disk units and you power off the system normally, you can move the adapter and disk units to another location.
 - b. Power on the system. For more information, see “Powering on and powering off” on page 641. Does the IP complete successfully?
No: Perform problem analysis to correct the new problem. **This ends the procedure.**
Yes: This ends the procedure.
19. You have chosen to initialize and format the identified disk units. Perform the following steps:
- Attention:** Performing the following steps causes a loss of customer data.
- a. If you are not already using dedicated service tools, perform an IPL to DST. For more information, see “Performing an IPL to DST” on page 695. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Select Work with disk units. Did you get to DST with a Type D IPL?
Yes: Continue with the next step.
No: Select **Work with disk unit recovery > Disk unit problem recovery procedures**, then continue with the next step.
20. Select **Initialize and format disk unit**.
21. Follow the online instructions to format and initialize the disk units.
22. Perform an IPL from disk. Does the IPL complete successfully?
No: Perform problem analysis and correct the new problem. **This ends the procedure.**
Yes: This ends the procedure.

IOIP31

Cache data associated with the attached devices cannot be found.

You were sent to this procedure from URC 9010.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Has the system been powered off for several days?
 - **No:** Go to step 4.
 - **Yes:** The cache battery pack may be depleted. Do NOT replace the I/O adapter or the cache battery pack. Reclaim the cache storage. See “Reclaiming IOP cache storage” on page 690. Then continue with the next step.

Note: When an auxiliary cache I/O adapter connected to the storage I/O adapter logs a 9055 SRC in the Product Activity Log, the Reclaim does not result in lost sectors. Otherwise, the Reclaim does result in lost sectors, and the system operator may want to restore data from the most recent saved tape after you complete the repair.
3. Does the IPL complete successfully?
No: Contact your next level of support. **This ends the procedure.**
Yes: This ends the procedure.
4. Are you working with a 571F/575B card set?
No: Go to step 6 on page 98.
Yes: Continue with the next step.
5. Remove the 571F/575B card set. Create a new card set with the following:

Note: Label all parts (both original and new) before moving them.

- The **new** replacement 571F storage IOA
- The cache directory card from the **original** 571F storage IOA
- The **original** 575B auxiliary cache adapter

See “Separating the 571F/575B card set and moving the cache directory card” on page 647.

- Ensure that the SCSI cable and the battery power cable on the top edge of the storage side of the card are connected to the top edge of the auxiliary cache side of the card.
- Reinstall this card set into the system and go to step 7.

6. Remove the I/O adapter. Install the **new** replacement storage I/O adapter with the following parts installed on it:

Note: Label all parts (both old and new) before moving them.

- The cache directory card from the **original** storage I/O adapter. On adapters with removable cache cards, the cache directory card will move with the removable cache card.
- The removable cache card from the **original** storage I/O adapter (this applies to only the 571E and some 2780 I/O adapters).

See Chapter 3, “Locating FRUs,” on page 347.

- If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see Chapter 8, “Part Information,” on page 741.

7. Did the 9010 SRC that sent you to this procedure occur on a type-D IPL?

No: Continue with the next step.

Yes: Perform a type-D IPL and continue with the next step.

8. Has a new 9010 or 9050 SRC occurred in the Service Action Log?

No: Go to step 11.

Yes: Continue with the next step.

9. Was the new SRC 9050?

No: Continue with the next step.

Yes: Contact your next level of support. **This ends the procedure.**

10. The new SRC was 9010. Reclaim the cache storage. See “Reclaiming IOP cache storage” on page 690.

Note: When an auxiliary cache I/O adapter that is connected to the storage I/O adapter logs a 9055 SRC in the Product Activity Log, the reclaim does not result in lost sectors. Otherwise, the reclaim does result in lost sectors, and the system operator might want to restore data from the most recent saved tape after you complete the repair.

11. Are you working with a 571F/575B card set?

No: Go to step 13 on page 99.

Yes: Continue with the next step.

12. Remove the 571F/575B card set. Create a new card set with the following:

- The **new** 571F storage IOA
- The cache directory card from the **new** 571F storage IOA
- The **new** 575B auxiliary cache adapter

See “Separating the 571F/575B card set and moving the cache directory card” on page 647.

- Ensure that the SCSI cable and the battery power cable on the top edge of the storage side of the card are connected to the top edge of the auxiliary cache side of the card.
- Reinstall this card set into the system.

This ends the procedure.

13. Remove the I/O adapter. Install the **new** replacement storage I/O adapter that has the following parts installed on it:
 - The cache directory card from the **new** storage I/O adapter. On adapters with removable cache cards, the cache directory card will move with the removable cache card.
 - The removable cache card from the **new** storage I/O adapter (this applies to only the 571E and some 2780 I/O adapters).

See Chapter 3, “Locating FRUs,” on page 347.

- If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see the Chapter 8, “Part Information,” on page 741.

This ends the procedure

IOPIP32

You were sent to this procedure from unit reference code (URC) 9011.

Attention: There is data in the cache of this I/O card, that belongs to devices other than those that are attached. Customer data may be lost.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Did you just exchange the storage I/O adapter as a result of a failure?

- **No:** Continue with the next step.
- **Yes:** Reclaim the cache storage. See “Reclaiming IOP cache storage” on page 690.

Does the IPL complete successfully?

No: You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**

Yes: This ends the procedure.

3. Have the I/O cards been moved or reconfigured recently?

- **No:** Ask your next level of support for assistance. **This ends the procedure.**
- **Yes:** Perform the following steps:
 - a. Power off the system. See “Powering on and powering off” on page 641 for details.
 - b. Restore all I/O cards to their original position.
 - c. Select the IPL type and mode that are used by the customer.
 - d. Power on the system.

Does the IPL complete successfully?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: This ends the procedure.

IOPIP33

The I/O processor card detected a device configuration error. The configuration sectors on the device may be incompatible with the current I/O processor card.

You were sent to this procedure from unit reference code (URC) 9001.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to (Determine if the system has logical partitions) before continuing with this procedure.

2. Has the I/O adapter been replaced with a different type of I/O adapter, or have the devices been moved from a different type of I/O adapter to this one?
 - **No:** Contact your next level of support. **This ends the procedure.**
 - **Yes:** Continue with the next step.
3. Does the disk unit contain data that needs to be saved?
 - **Yes:** Continue with the next step.
 - **No:** Initialize and format the disk units.
Attention: Any data on the disk unit will be lost. Perform the following:
 - a. Access SST or DST.
 - b. Select **Work with disk units**.
 - c. Did you get to DST with a type D IPL?
 - **No:** Select **Work with disk unit recovery** → **Disk unit problem recovery procedures**. Then, continue with the next step.
 - **Yes:** Continue with the next step.
 - d. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display will show that the status is complete. This may take 30 minutes or longer.
 - e. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**
4. The disk unit contains data that needs to be saved.
 - If the I/O adapter has been replaced with a different type of I/O adapter, reinstall the original I/O adapter. Then continue with the next step.
 - If the disk units have been moved from a different type of I/O adapter to this one, return the disk units to their original I/O adapter. Then continue with the next step.
5. Stop parity protection on the disk units, and power down the system normally with the I/O adapter in an operational state. The I/O adapter or disk units can now be returned to the configuration at the beginning of this procedure. **This ends the procedure.**

IOPIP34

You were sent to this procedure from unit reference code (URC) 9027.

The I/O processor card detected that an array is not functional due to the present hardware configuration.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to (Determine if the system has logical partitions) before continuing with this procedure.
2. Has the I/O adapter been replaced with a different I/O adapter, or have the devices been moved from a different I/O adapter to this one?
 - **No:** Perform (IOPIP22). **This ends the procedure.**
 - **Yes:** Perform the following:
 - a. Power off the system. See (Power on/off the system and logical partitions).
 - b. Restore all I/O cards or devices to their original position.
 - c. Power on the system.
3. Does the IPL complete successfully?
 - **No:** Ask your next level of support for assistance. **This ends the procedure.**
 - **Yes:** **This ends the procedure.**

IOPIP40

Use this procedure to isolate the problem when a storage I/O adapter is connected to an incompatible or non-operational auxiliary cache I/O adapter.

Perform the following:

1. Are you working on a 571F/575B combination storage and auxiliary cache IOA card set (uses two card slot locations)?
 - **Yes:** Continue with step 2.
 - **No:** Continue with step 3.
2. Find the location of the card.
 - Use the location displayed in the Service Action Log. If the Service Action Log does not have a location, determine the address of the I/O adapter. See “The System Reference Code (SRC) Format Description” on page 654.
 - The location identified is for the 571F side of the card set.

You must configure both the 571F and the 575B in the same partition. Are both the 571F side of the card set and the 575B side of the card set configured in the same partition?

- **Yes:** Replace the entire card set. See Chapter 3, “Locating FRUs,” on page 347. **This ends the procedure.**
 - **No:** Change the configuration so that the same partition controls both cards in the card set. **This ends the procedure.**
3. Ensure that the SCSI cable on the last port of the storage I/O adapter is connected to the auxiliary cache I/O adapter. Do the following:
 - a. Use the location of the storage I/O adapter displayed in the Service Action Log. If the Service Action Log does not have a location, determine the address of the storage I/O adapter. See “The System Reference Code (SRC) Format Description” on page 654.
 - b. Determine the location of the storage I/O adapter. See Chapter 3, “Locating FRUs,” on page 347.
 - c. Ensure that the SCSI cable on the last port of the storage I/O adapter is properly connected to an auxiliary cache I/O adapter.
 - d. Ensure that both the auxiliary cache I/O adapter and the storage I/O adapter are in the same partition.
 - e. Ensure that the slot power indicator is lit for the auxiliary cache I/O adapter. If it is not, use concurrent maintenance to power on the slot.
 4. Ensure that the auxiliary cache I/O adapter is supported for the storage I/O adapter to which it is connected. See the PCI adapter installation instructions for information about which adapters are compatible.
 5. Replace the SCSI cable on the last port of the storage I/O adapter that connects to the auxiliary cache I/O adapter. See Chapter 8, “Part Information,” on page 741 for cable part number information. If this does not fix the problem, replace the auxiliary cache I/O adapter. **This ends the procedure.**

IOPIP41

Use this procedure to correct the problem when an auxiliary cache I/O adapter is not connected to a storage I/O adapter or when an auxiliary cache I/O adapter is connected to an incompatible or non-operational storage I/O adapter.

Perform the following:

1. Are you working on a 571F/575B combination storage and auxiliary cache IOA card set (uses two card slot locations)?
 - **Yes:** Continue with step 2.
 - **No:** Continue with step 3 on page 102.
2. Find the location of the card.
 - Use the location displayed in the Service Action Log. If the Service Action Log does not have a location, determine the address of the I/O adapter. See “The System Reference Code (SRC) Format Description” on page 654.

- The location identified is for the 575B side of the card set.

You must configure both the 571F and the 575B in the same partition. Are both the 571F side of the card set and the 575B side of the card set configured in the same partition?

- **Yes:** Replace the entire card set. See Chapter 3, “Locating FRUs,” on page 347 for the model you are working on. **This ends the procedure.**
 - **No:** Change the configuration so that the same partition controls both cards in the card set. **This ends the procedure.**
3. Ensure that the SCSI cable of the auxiliary cache I/O adapter is connected to the last port of the storage I/O adapter. Do the following:
 - a. Use the location of the auxiliary cache I/O adapter displayed in the Service Action Log. If the Service Action Log does not have a location, determine the address of the auxiliary cache I/O adapter. See “The System Reference Code (SRC) Format Description” on page 654.
 - b. Determine the location of the auxiliary cache I/O adapter. See Chapter 3, “Locating FRUs,” on page 347 for the model you are working on.
 - c. Ensure that the SCSI cable of the auxiliary cache I/O adapter is properly connected to the last port of the storage I/O adapter.
 - d. Ensure that both the auxiliary cache I/O adapter and the storage I/O adapter are in the same partition.
 - e. Ensure that the slot power indicator is lit for the storage I/O adapter. If it is not, use concurrent maintenance to power on the slot.
 4. Did you just replace the auxiliary cache I/O adapter because of a failure and did the new replacement auxiliary cache I/O adapter log a 9073 URC?
 - **Yes:** The SCSI bus on the storage I/O adapter may be disabled as a result of the initial failure. Use Hardware Service Manager to re-IPL the storage I/O adapter that is connected to the new replacement auxiliary cache I/O adapter. **This ends the procedure.**
 - **No:** Continue with the next step.
 5. Ensure that the auxiliary cache I/O adapter is supported for the storage I/O adapter to which it is connected. See the PCI adapter installation instructions for information about which adapters are compatible.
 6. Replace the SCSI cable that connects the auxiliary cache I/O adapter to the storage I/O adapter. See Chapter 8, “Part Information,” on page 741 for cable part number information. If this does not fix the problem, replace the storage I/O adapter. **This ends the procedure.**

Licensed internal code (LIC) isolation procedures

Use this section to isolate licensed internal code (LIC) problems.

Please read and observe all safety procedures before servicing the system and while performing a procedure.

Attention: Unless instructed otherwise, always power off the system or expansion tower where the FRU is located before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

“LICIP01” on page 104

Licensed Internal Code detected an IOP programming problem.

“LICIP03” on page 105

Dedicated service tools (DST) found a permanent program error, or a hardware failure occurred.

“LICIP04” on page 106

The initial program load (IPL) service function ended.

“LICIP07” on page 106

The system detected a problem while communicating with a specific I/O processor.

“LICIP08” on page 109

Licensed Internal Code detected an operating system program problem.

“LICIP11” on page 109

Use this procedure to isolate a system **STARTUP** failure in the initial program load (IPL) mode.

“LICIP12” on page 120

Use this procedure to isolate an Independent Auxiliary Storage Pool (IASP) vary on failure.

“LICIP13” on page 124

A disk unit seems to have stopped communicating with the system.

“LICIP14” on page 129

Licensed Internal Code detected a card slot test failure.

“LICIP15” on page 130

Use this procedure to help you recover from an initial program load (IPL) failure.

“LICIP16” on page 132

Use this procedure to identify an adapter that is operational but is not located in the same partition as its associated adapter.

LICIP01

Licensed Internal Code detected an IOP programming problem.

You will need to gather data to determine the cause of the problem. If using **OptiConnect**, and the IOP is connected to another system, then collect this information from both systems. Read the “Licensed internal code (LIC) isolation procedures” on page 103 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Is the system operational: Did the SRC come from the Service Action Log, Product Activity Log, problem log, or system operator message?
 - **No:** Go to step 9 on page 105.
 - **Yes:** Is this a x6xx5121 SRC?
 - No:** Continue with the next step.
 - Yes:** Go to step 4.
3. If the IOP has DASD attached to it, then the IOP dump is in SID87 (or SID187 if the DASD is mirrored). Copy the IOP dump. See “Working with Storage Dumps” on page 691.
4. Print the Product Activity Log, including any IOP dumps, to removable media for the day which the problem occurred. Select the option to obtain HEX data.
5. Use the “Licensed Internal Code log” service function under DST/SST to copy the LIC log entries to removable media for the day that the problem occurred.
6. Copy the system configuration list. See “Printing the System Configuration List” on page 699.
7. Provide the dumps to Service Support.
8. Check the Logical Hardware Resource STATUS field using Hardware Service Manager. If the status is not *Operational* then IPL the IOP using the I/O Debug option. Ignore resources with a status of *not connected*.

To IPL a failed IOP, the following command can be used: `VRYCFG CFG0BJ(XXXX) CFGTYPE(*CTL) STATUS(*RESET)` or use DST/SST Hardware Service Manager.

If the IPL does not work:

- Check the Service Action Log for new SRC entries. See “Using the Service Action Log” on page 663. Use the new SRC and perform problem analysis to correct the problem.
- If there are no new SRCs in the Service Action Log, contact your next level of support. **This ends the procedure.**

9. Has the system stopped but the DST console is still active: Did the SRC come from the Main Storage Dump manager screen on the DST console?
Yes: Continue with the next step.
No: Go to step 15.
10. Complete a Problem Summary Form using the information in words 1-9 from the control panel, or from the DST Main Storage Dump screen.
11. The system has already taken a partial main storage dump for this SRC and automatically re-IPLed to DST.
12. Copy the main storage dump to tape. See “Working with Storage Dumps” on page 691.
13. When the dump is completed, the system will re-IPL automatically. Sign on to DST or SST. Obtain the data in steps 3 on page 104, 4 on page 104, 5 on page 104, and 6 on page 104.
14. Provide the dumps to Service Support. **This ends the procedure.**
15. Has the system stopped with an SRC at the control panel?
Yes: Continue with the next step.
No: Go to step 2 on page 104.
16. Complete a Problem Summary Form using the information in words 1-9 from the control panel, or from the DST Main storage dump screen.
17. Do **NOT** power off the system. Perform a manual IPL to DST, and start the Main storage dump manager service function.
18. Copy the main storage dump to tape.
19. Obtain the data in steps 3 on page 104, 4 on page 104, 5 on page 104, and 6 on page 104.
20. Re-IPL the system.
21. Has the system stopped with an SRC at the control panel?
Yes: Using the new SRC, perform problem analysis to correct the problem. **This ends the procedure.**
No: Provide the dumps to Service Support. **This ends the procedure.**

LICIP03

Dedicated service tools (DST) found a permanent program error, or a hardware failure occurred.

Read the danger notices in the “Licensed internal code (LIC) isolation procedures” on page 103 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Does URC 50FF occur?
No: Continue with the next step.
Yes: Go to step 4.
3. Perform a main storage dump, then perform an IPL by doing the following:
 - a. Perform a main storage dump. See “Working with Storage Dumps” on page 691.
 - b. Select **Manual** mode and perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - c. When the IPL has completed, the system console should be at the DST display. Go to step 7 on page 106. If the DST display does not appear on the system console, contact your next level of support.
4. Perform a main storage dump, then perform an IPL by doing the following:
 - a. Perform a main storage dump. See “Working with Storage Dumps” on page 691.
 - b. Select **Manual** mode and perform an IPL to DST. See “Performing an IPL to DST” on page 695.Does a display appear?

No: Continue with the next step.

Yes: Go to step 7.

5. If the problem is in the logical partition, exchange the first workstation I/O processor card on bus 1. See Chapter 4, “Removing and Replacing FRUs,” on page 357.

6. Select **Manual** mode and perform an IPL to DST. See “Performing an IPL to DST” on page 695.

Is the IPL or Install the System display shown?

Yes: Continue with the next step.

No: Ask your next level of support for assistance and report the problem. **This ends the procedure.**

7. Copy the main storage dump to removable media. See “Working with Storage Dumps” on page 691.
8. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

LICIP04

The initial program load (IPL) service function ended.

Dedicated service tools (DST) was in the disconnected status or lost communications with the IPL console because of a console failure and could not communicate with the user. Read the danger notices in “Licensed internal code (LIC) isolation procedures” on page 103 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.

2. Select function **21** (Make DST Available) on the control panel and press **Enter** to start DST again.

Does the DST Sign On display appear?

- **No:** Continue with the next step.

- **Yes:** Perform the following steps (see “Dedicated Service Tools (DST)” on page 692 for details):

- a. Select **Start a Service Tool** → **Licensed Internal Code log**.

- b. Perform a dump of the Licensed Internal Code log to tape. See “Start a service tool” on page 697 for details.

- c. Return here and continue with the next step.

3. Perform a main storage dump. See “Working with Storage Dumps” on page 691 for details.
4. Copy the main storage dump to removable media. See “Working with Storage Dumps” on page 691 for details.
5. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

LICIP07

The system detected a problem while communicating with a specific I/O processor.

The problem could be caused by Licensed Internal Code, the I/O processor card, or by bus hardware. Read the danger notices in “Licensed internal code (LIC) isolation procedures” on page 103 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.

2. Did a previous procedure have you power off the system, perform an IPL in Manual mode, **and** is the system in Manual mode now?

- **Yes:** Continue with the next step.

- **No:** Perform the following steps:

- a. Power off the system. See “Powering on and powering off” on page 641 for details.

- b. Select **Manual** mode on the control panel. See “IPL type, mode, and speed options” on page 697 for details.
 - c. Power on the system.
 - d. Continue with the next step.
3. Does the SRC that sent you to this procedure appear on the control panel?
 - **No:** Continue with the next step.
 - **Yes:** Use the information in the SRC to determine the card direct select address. If the SRC is B6006910, you can use the last 8 characters of the top 16 character line of function 13 (word 7) to find the card direct select address in BBBBCcbb format.
BBBB Bus number
Cc Card direct select address
bb board address
 Go to step 11 on page 108.
4. Does the console display indicate a problem with missing disks?
 - Yes:** Continue with the next step.
 - No:** Go to step 6.
5. Perform the following steps:
 - a. Go to the DST main menu.
 - b. On the DST sign-on display, enter the DST full authority user ID and password. See “Dedicated Service Tools (DST)” on page 692 for details.
 - c. Select **Start a service tool** → **Hardware service manager**.
 - d. Check for the SRC in the service action log. See “Using the Service Action Log” on page 663. Did you find the same SRC that sent you to this procedure?
 - **Yes:** Note the date and time for that SRC. Go to the Product Activity Log and search all logs to find the same SRC. When you have found the SRC, go to step 9 on page 108.
 - **No:** Perform the following steps:
 - 1) Return to the DST main menu.
 - 2) Perform an IPL and return to the Display Missing Disk Units display.
 - 3) Go to “LICIP11” on page 109. **This ends the procedure.**
6. Does the SRC that sent you to this procedure appear on the console or on the alternative console?
 - **Yes:** Continue with the next step.
 - **No:** Does the IPL complete successfully to the IPL or Install the System display?
 - Yes:** Continue with the next step.
 - No:** A different SRC occurred. Use the new SRC to correct the problem. **This ends the procedure.**
7. Perform the following:
 - a. Use the full-authority password to sign on to DST.
 - b. Search *All logs* in the product activity log looking for references of SRC B600 5209 and the SRC that sent you to this procedure.

Note: Search only for SRCs that occurred during the last IPL.
 Did you find B600 5209 or the same SRC that sent you to this procedure?
 - **Yes:** Go to step 10 on page 108.
 - **No:** Did you find a different SRC than the one that sent you to this procedure?
 - Yes:** Continue with the next step.
 - No:** The problem appears to be intermittent. Ask your next level of support for assistance. **This ends the procedure.**
8. Use the new SRC to correct the problem. **This ends the procedure.**

9. Use **F11** to move through alternative views of the log analysis displays until you find the card position and frame ID of the failing IOP associated with the SRC.

Was the card position and frame ID available, **and** did this information help you find the IOP?

No: Continue with the next step.

Yes: Go to step 12.

10. Perform the following steps:

- a. Display the report for the log entry of the SRC that sent you to this procedure.
- b. Display the additional information for the entry.
- c. If the SRC is B6006910, use characters 9-16 of the top 16 character line of function 13 (word 7) to find the card direct select address in BBBBCcbb format.

BBBB Bus number

Cc Card direct select address

bb board address

11. Use the BBBBCcbb information and refer to Chapter 3, "Locating FRUs," on page 347 to determine the failing IOP and its location.

12. Go to "MABIP55" on page 56 to isolate an I/O adapter problem on the IOP you just identified. If this fails to isolate the problem, return here and continue with the next step.

13. Is the I/O processor card you identified in step 9 or step 11 the CFIOIP?

- **No:** Continue with the next step.

- **Yes:** Perform the following steps:

- a. Exchange the failing CFIOIP card. See Chapter 3, "Locating FRUs," on page 347.

Note: You will be prompted for the system serial number. Ignore any error messages regarding system configuration that appear during the IPL.

- b. Go to step 16.

14. Perform the following steps:

- a. Power off the system.
- b. Remove the IOP card.
- c. Power on the system.

Does the SRC that sent you to this procedure appear on the control panel or appear as a new entry in the service action log or product activity log?

- **No:** Continue with the next step.

- **Yes:** Perform the following steps:

- a. Power off the system.
- b. Install the IOP card you just removed.
- c. Replace the I/O backplane (Un-P1). **This ends the procedure.**

15. Perform the following steps:

- a. Power off the system.
- b. Exchange the failing IOP card.

16. Power on the system.

Does the SRC that sent you to this procedure appear on the control panel, on the console, or on the alternative console?

No: Continue with the next step.

Yes: Go to step 18 on page 109.

17. Does a different SRC appear on the control panel, on the console, or on the alternative console?

- **Yes:** Use the new SRC to correct the problem. **This ends the procedure.**

- **No:** On the IPL or Install the System display, check for the SRC in the service action log. See "Using the Service Action Log" on page 663 for details.

Did you find the same SRC that sent you to this procedure?

Yes: Continue with the next step.

No: Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

18. Perform the following steps:

- a. Power off the system.
- b. Remove the IOP card you just exchanged and install the original card.
- c. Go to (Bus-PIP1). **This ends the procedure.**

19. Ask your next level of support for assistance and report a Licensed Internal Code problem. You may be asked to verify that all PTFs have been applied.

If you are asked to perform the following, see the following:

- Copy the main storage dump from disk to tape or diskette, see “Working with Storage Dumps” on page 691.
- Print the product activity log, see “Using the product activity log” on page 76.
- Copy the IOP storage dump to removable media, see “Working with Storage Dumps” on page 691.

This ends the procedure.

LICIP08

Licensed Internal Code detected an operating system program problem.

Read the danger notices in “Licensed internal code (LIC) isolation procedures” on page 103 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.

2. Select **Manual** mode and perform an IPL to DST. See “Performing an IPL to DST” on page 695.

Does the same SRC occur?

- **Yes:** Go to step 5.
- **No:** Does the same URC appear on the console?

No: Continue with the next step.

Yes: Go to step 4.

3. Does a different SRC occur, or does a different URC appear on the console?

- **Yes:** Use the new SRC or reference code to correct the problem. If the procedure for the new SRC sends you back to this procedure, then continue with the next step. **This ends the procedure.**
- **No:** Select **Perform an IPL** on the IPL or Install the System display to complete the IPL.

Is the problem intermittent?

Yes: Continue with the next step.

No: **This ends the procedure.**

4. Copy the main storage dump to removable media. See “Working with Storage Dumps” on page 691.

5. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

LICIP11

Use this procedure to isolate a system **STARTUP** failure in the initial program load (IPL) mode.

Ensure you have read the danger notices in “Licensed internal code (LIC) isolation procedures” on page 103 before continuing with this procedure.

How to find the cause code

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646.
2. Were you given a cause code by another procedure?
No: Continue with the next step.
Yes: Use the cause code given by the other procedure. Then, go to step 4.
3. Look at the Data display characters in word 3. You can obtain these characters by either:
 - Looking at word 3 on the Problem summary form that was filled out earlier.
 - Selecting characters 9-16 of the top 16 character line of function 12 (word 3).
4. The 4 leftmost characters of word 3 represent the **cause code**. Select the cause code to go to the correct isolation instructions:

“0001”	“0010” on page 116	“0020” on page 118	“0031” on page 119
“0002”	“0011” on page 116	“0021” on page 118	“0033” on page 119
“0004” on page 113	“0012” on page 116	“0022” on page 118	“0034” on page 119
“0005” on page 114	“0015” on page 116	“0023” on page 118	“0035” on page 120
“0006” on page 114	“0016” on page 116	“0024” on page 118	“0037” on page 120
“0007” on page 114	“0017” on page 116	“0025” on page 119	“0099” on page 120
“0008” on page 114	“0018” on page 116	“0026” on page 119	
“0009” on page 114	“0019” on page 116	“0027” on page 119	
“000A” on page 114	“001A” on page 117		
“000B” on page 115	“001C” on page 117		
“000C” on page 115	“001D” on page 117		
“000D” on page 115	“001E” on page 117		
“000E” on page 115	“001F” on page 117		

0001

Disk configuration is missing.

1. Select **Manual** mode and perform an IPL to DST for the failing partition (see “Performing an IPL to DST” on page 695). Does the Disk Configuration Error Report display appear?
Yes: Continue with the next step.
No: The IPL completed successfully. **This ends the procedure.**
2. Is Missing Disk Configuration information displayed?
Yes: Continue with the next step.
No: Go to step 1 on page 111 for cause code 0002.
3. On the Missing Disk Configuration display, perform the following:
 - a. Select option **5** → **Display Detailed Report** → **Work with disk units** → **Work with disk unit recovery** → **Recover Configuration**.
 - b. Follow the instructions on the display. After the disk configuration is recovered, the system automatically performs an IPL. **This ends the procedure.**

0002

Disk units are missing from the disk configuration.

Data from the control panel can be used to find information about the missing disk unit.

1. Did you enter this procedure because all the devices listed on the Display Missing Units display (reached from the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display) have a reference code of 0000?

No: Continue with the next step.

Yes: Go to step 20 on page 113.

2. Have you installed a new disk enclosure in a disk unit and not restored the data to the disk unit?

No: Continue with the next step.

Yes: Ignore SRC A600 5090. Continue with the disk unit exchange recovery procedure. **This ends the procedure.**

3. Use words 1-9 from the information recorded on the Problem summary form to determine the disk unit that is missing from the configuration:

- Characters 1-8 of the bottom 16 character line of function 12 (word 4) contain the IOP direct select address.
- Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit type, level and model number.
- Characters 9-16 of the top 16 character line of function 13 (word 7) contains the disk unit serial number.

Note: For 2105 and 2107 disk units, the 5 rightmost characters of word 7 contain the disk unit serial number.

- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the number of missing disk units.

Are the problem disk units 432x, 433x, 660x, 671x, or 673x disk units?

No: Continue with the next step.

Yes: Go to step 5.

4. Attempt to get all devices attached to the MSIOP to Ready status by performing the following:
 - a. The MSIOP address (MSIOP Direct Select Address) to use is characters 1-8 of the bottom 16 character line of function 12 (word 4).
 - b. Verify the following and correct if necessary before continuing with step 10 on page 112.
 - All cable connections are made correctly and are tight.
 - All storage devices have the correct signal bus address, as indicated in the system configuration list.
 - All storage devices are powered on and ready.

5. Did you enter this procedure because there was an entry in the Service Action Log which has the reference code B6005090?

Yes: Continue with the next step.

No: Go to step 10 on page 112.

6. Are customer jobs running on the system now?

Yes: Continue with the next step.

No: Ensure that the customer is not running any jobs before continuing with this procedure. Then go to step 10 on page 112.

7. Select **System Service Tools (SST)** → **Work with disk units** → **Display disk configuration** → **Display disk configuration status**.

Are any disk units missing from the configuration (indicated by an asterisk *)?

Yes: Continue with the next step.

No: This ends the procedure.

8. Do all of the disk units that are missing from the configuration have a status of "Suspended"?

Yes: Continue with the next step.

- No:** Ensure that the customer is not running any jobs before continuing with this procedure. Then go to step 10.
9. Use the Service Action Log to determine if there are any entries for the missing disk units (see “Using the Service Action Log” on page 663). Are there any entries in the Service Action Log for the missing disk units that were logged since the last IPL?
- Yes:** Use the information in the Service Action Log, and look up the reference code to read its description.). Perform the action indicated for the unit reference code. **This ends the procedure.**
- No:** Go to step 21 on page 113.
10. Select **Manual** mode and perform an IPL to DST for the failing partition (see “Performing an IPL to DST” on page 695). Does the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear?
- Yes:** Continue with the next step.
- No:** The IPL completed successfully. **This ends the procedure.**
11. Does one of the following messages appear in the list?
- Missing disk units in the configuration
 - Missing mirror protected disk units in the configuration
- Yes:** Continue with the next step.
- No:** Go to step 16.
12. Select option 5. Do the missing units have device parity protected status? (Device parity protection status is indicated by "DPY/" as the first four characters of the status.)
- Yes:** Continue with the next step.
- No:** Go to step 14.
13. Is the status DPY/Active?
- Yes:** Continue with the next step.
- No:** Use the Service Action Log to determine if there are any entries for the missing disk units or the IOA/IOP controlling them. See “Using the Service Action Log” on page 663 for details. **This ends the procedure.**
14. Press **F11**, and press **Enter** to display the details.
- Do all of the disk units listed on the display have a reference code of 0000?
- Yes:** Continue with the next step.
- No:** Use the disk unit reference code shown on the display and look up the reference code.. Perform the action indicated for the unit reference code. **This ends the procedure.**
15. Do all of the IOPs or devices listed on the display have a reference code of 0000?
- No:** Use the IOP reference code shown on the display and look up the reference code.. Perform the action indicated for the reference code. **This ends the procedure.**
- Yes:** Go to step 20 on page 113.
16. Does the following message appear in the list: Unknown load-source status?
- Yes:** Continue with the next step.
- No:** Go to step 18.
17. Select option 5, press **F11**, and then press **Enter** to display the details.
- Does the Assign Missing Load Source Disk display appear?
- No:** Continue with the next step.
- Yes:** Press **Enter** to assign the missing load-source disk unit. **This ends the procedure.**
18. Does the following message appear in the list?
- Load source failure
- Yes:** Continue with the next step.
- No:** The IPL completed successfully. **This ends the procedure.**

19. Select option **5**, press **F11**, and then press **Enter** to display the details.
20. The number of failing disk unit facilities (actuators) is the number of disk units displayed. A disk unit has a *Unit* number greater than zero.
Find the failing disk unit by type, model, serial number, or address displayed on the console.
21. Is there more than one failing disk device attached to the IOA or MSIOP?
Yes: Continue with the next step.
No: Go to step 24.
22. Use the SAL to determine if there are any entries that occurred around the time of the A6xx/B6xx 5090 SRC (see "Using the Service Action Log" on page 663). Are there any such entries?
No: Continue with the next step.
Yes: Use the information in the SAL and look up the reference code.). Perform the action indicated for the unit reference code. **This ends the procedure.**
23. Are all the disk devices that are attached to the IOA or MSIOP failing? (If the disk units are using mirrored protection, select **Display Disk Status** to find out.)
No: Continue with the next step.
Yes: Go to step 25.
24. Look up the SRC listed below for the specific disk unit and exchange the FRUs shown one at a time. Then return here and answer the question below the listed disk units.

Disk Unit	SRC to look up
2105	21053002
2107	21073002
432x	432x3002
433x	433x3002
660x	660x3002
671x	671x3002
673x	673x3002

Did the disk unit service information correct the problem?

No: Continue with the next step.

Yes: This ends the procedure.

25. Exchange the IOA or MSIOP (see Chapter 3, "Locating FRUs," on page 347).
If exchanging the IOA or MSIOP did not correct the problem, use the original SRC and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, Look up the FI code to help determine parts and locations. **This ends the procedure.**

0004

Some disk units are unprotected but configured into a mirrored ASP. These units were originally DPY protected but protection was disabled.

Perform the following:

1. Is the system managed by an HMC?
Yes: Select **DST** by performing the HMC action for Function 21 for the failing partition (see "Control panel function codes on the HMC" on page 693). Then continue with the next step.
No: Select **DST** using Function 21 for the failing partition (see "Selecting function 21 from the control panel" on page 693 in "Service functions" on page 709). Then continue with the next step.
2. Select **Work with disk units** and take the actions to protect the system.

If you do not know what actions to take, select **Manual** mode and perform an IPL to DST for the failing partition. See “Performing an IPL to DST” on page 695.

When the Disk configuration error report appears, the recovery actions are listed in the Help text for the error message “Unprotected disk units in a mirrored ASP”. **This ends the procedure.**

0005

A disk unit using parity protection is operating in exposed mode.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See “Performing an IPL to DST” on page 695.
2. Choose from the following options:
 - If the same reference code appears, ask your next level of support for assistance.
 - If no reference code appears and the IPL completes successfully, the problem is corrected.
 - If a different reference code appears, use it to perform problem analysis and correct the new problem. **This ends the procedure.**

0006

There are new devices attached to the system that do not have Licensed Internal Code installed. Ask your next level of support for assistance.

0007

Some of the configured disk units have device parity protection disabled when the system expected device parity protection to be enabled.

1. Is the system managed by an HMC?
 - Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition (see “Control panel function codes on the HMC” on page 693). Then continue with the next step.
 - No:** Select **DST** using Function 21 for the failing partition (see “Selecting function 21 from the control panel” on page 693 in “Service functions” on page 709). Then continue with the next step.
2. Correct the problem by doing the following:
 - a. Select **Work with disk units** → **Work with disk unit recovery** → **Correct device parity protection**.
 - b. Follow the online instructions. **This ends the procedure.**

0008

A disk unit has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See “The System Reference Code (SRC) Format Description” on page 654.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.

432x 102E, 433x 102E, 660x 102E, 671x 102E, 673x 102E (Look up a reference code.).

This ends the procedure.

0009

The procedure to restore a disk unit from the tape unit did not complete. Continue with the disk unit exchange recovery procedure.

000A

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system.

Perform the following:

1. Is the system managed by an HMC?

Yes: Select **DST** by performing the HMC action for Function 21 for the failing partition (see “Control panel function codes on the HMC” on page 693). Then continue with the next step.

No: Select **DST** using Function 21 for the failing partition (see “Selecting function 21 from the control panel” on page 693 in “Service functions” on page 709). Then continue with the next step.

2. On the Service Tools display, select **Start a Service Tool** → **Product activity log** → **Analyze log**.
3. On the Select Subsystem Data display, select the option to view **All Logs**.

Note: You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

4. Use the defaults on the Select Analysis Report Options display by pressing **Enter**.
5. Search the entries on the Log Analysis Report display for system reference codes associated with the missing disk units.
6. Go to Reference codes to correct the problem. **This ends the procedure.**

000B

Some system IOPs require cache storage be reclaimed.

1. Is the system managed by an HMC?

Yes: Select **DST** by performing the HMC action for Function 21 for the failing partition (see “Control panel function codes on the HMC” on page 693). Then continue with the next step.

No: Select **DST** using Function 21 for the failing partition (see “Selecting function 21 from the control panel” on page 693 in “Service functions” on page 709). Then continue with the next step.

2. Reclaim the cache adapter card storage. See “Reclaiming IOP cache storage” on page 690.

Note: The system operator may want to restore data from the most recent saved tape after you complete the repair.

This ends the procedure.

000C

One of the mirror protected disk units has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See “System Reference Code (SRC) Information” on page 654.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.

432x 102E, 433x 102E, 660x 102E, 671x 102E, 673x 102E (Look up a reference code.).

This ends the procedure.

000D

The system disk capacity has been exceeded.

For more information about disk capacity, see *iSeries Handbook*, GA19-5486-20.

000E

Start compression failure.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See “Performing an IPL to DST” on page 695.
2. Correct the problem by doing the following:
 - a. Select **Work with disk units** → **Work with disk unit recovery** → **Recover from start compression failure**.
 - b. Follow the on-line instructions. **This ends the procedure.**

0010

The disk configuration has changed.

The operating system must be installed again, and all customer data must be restored.

1. Select **Manual** mode on the control panel.
2. Perform an IPL to reinstall the operating system.
3. The customer must restore all data from the latest system backup. **This ends the procedure.**

0011

The serial number of the control panel does not match the system serial number.

1. Select **Manual** mode on the control panel.
2. Perform an IPL. You will be prompted for the system serial number. **This ends the procedure.**

0012

The operation to write the vital product data (VPD) to the control panel failed.

Exchange the multiple function I/O processor card. See Chapter 3, "Locating FRUs," on page 347 for the model you are working on for the location of the card and a link to the remove and replace procedure.

0015

The mirrored load-source disk unit is missing from the disk configuration. Go to step 1 on page 111 for cause code 0002.

0016

A mirrored protected disk unit is missing. Wait six minutes. If the same reference code appears, go to step 1 on page 111 for cause code 0002.

0017

One or more disk units have a lower level of mirrored protection than originally configured.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See "Performing an IPL to DST" on page 695.
2. Review the detailed display, which shows the new and the previous levels of mirrored protection. **This ends the procedure.**

0018

Load-source configuration problem. The load-source disk unit is using mirrored protection and is configured at an incorrect address. Ensure that the load-source disk unit is in device location 1.

0019

One or more disk units were formatted incorrectly.

The system will continue to operate normally. However, it will not operate at optimum performance. To repair the problem, perform the following:

1. Record the unit number and serial number of the disk unit that is formatted incorrectly.
2. Sign on to DST. See "Accessing Dedicated Service Tools" on page 692.
3. Select **Work with disk units** → **Work with disk unit configuration** → **Remove unit from configuration**.
4. Select the disk unit you recorded earlier in this procedure.
5. Confirm the option to remove data from the disk unit. This step may take a long time because the data must be moved to other disk units in the auxiliary storage pool (ASP).
6. When the remove function is complete, select **Add unit to configuration**.

7. Select the disk unit you recorded earlier in this procedure.
8. Confirm the add. The disk unit is formatted during functional operation. **This ends the procedure.**

001A

The load-source disk unit data is down-level.

The load-source disk unit is mirror protected. The system is using the load-source disk unit that does not have the current level of data.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See “Performing an IPL to DST” on page 695. Does the Disk Configuration Error Report display appear?
No: The system is now using the correct load-source. **This ends the procedure.**
Yes: Continue with the next step.
2. Does a “Load source failure” message appear in the list?
Yes: Continue with the next step.
No: The system is now using the correct load-source. **This ends the procedure.**
3. Select option **5**, press **F11**, and then press **Enter** to display details.
The load-source type, model, and serial number information that the system needs is displayed on the console.
Is the load-source disk unit (displayed on the console) attached to an MSIOP that cannot be used for a load-source?
Yes: Contact your next level of support. **This ends the procedure.**
No: The load-source disk unit is missing. Go to step 1 on page 111 for cause code 0002.

001C

The disk units that are needed to update the system configuration are missing.

Perform an IPL by doing the following:

1. Select **Manual** mode on the control panel.
2. Perform an IPL. Use the IPL information to determine the cause of the problem. **This ends the procedure.**

001D

1. Is the Disk Configuration Attention Report, or the Disk Configuration Warning Report displayed?
Yes: Continue with the next step.
No: Ask your next level of support for assistance. **This ends the procedure.**
2. On the Bad Load Source Configuration message line, select **5**, and press **Enter** to rebuild the load-source configuration information. If there are other types of warnings, select option **5** on the warnings, and correct the problem. **This ends the procedure.**

001E

The load-source data must be restored.

001F

Licensed Internal Code was installed on the wrong disk unit of the load-source mirrored pair.

The system performed an IPL on a load source that may not contain the same level of Licensed Internal Code that was installed on the other load source. The type, model, and address of the active device are displayed in words 4-7 of the SRC.

Choose from the following options:

1. If the load-source disk unit in position 1 contains the correct level of Licensed Internal Code, perform the following:
 - a. Select **Manual** mode and perform an IPL to DST for the failing partition. See “Performing an IPL to DST” on page 695. Is the Disk Configuration Attention Report or Disk Configuration Warning Report displayed?
Yes: Select option **5** on the Incorrect Licensed Internal Code Install message line. When the Display Incorrect Licensed Internal Code Install display appears on the console, press **Enter**.
No: The system is now using the correct load source. **This ends the procedure.**
2. If the load-source disk unit in position 1 of the system unit does **not** contain the correct level of Licensed Internal Code, restore the Licensed Internal Code to the disk unit in position 1 of the system unit. **This ends the procedure.**

0020

The system appears to be a one disk unit system. Select **Manual** mode and perform an IPL to DST for the failing partition. See “Performing an IPL to DST” on page 695.

0021

The system password verification failed.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See “Performing an IPL to DST” on page 695.
2. When prompted, enter the correct system password. If the correct system password is not available perform the following:
 - a. Select **Bypass the system password**.
 - b. Have the customer contact the marketing representative immediately to order a new system password from your service provider. **This ends the procedure.**

0022

A different compression status was expected on a reporting disk unit. Accept the warning. The reported compression status will be used as the current compression status.

0023

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system. The system is capable of IPLing in this state.

1. Is the system managed by an HMC?
Yes: Select **DST** by performing the HMC action for Function 21 for the failing partition (see “Control panel function codes on the HMC” on page 693). Then continue with the next step.
No: Select **DST** using Function 21 for the failing partition (see “Selecting function 21 from the control panel” on page 693 in “Service functions” on page 709). Then continue with the next step.
2. On the Service Tools display, select **Start a Service Tool** → **Product activity log** → **Analyze log**.
3. On the Select Subsystem Data display, select the option to view All Logs.

Note: You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.
4. Use the defaults on the Select Analysis Report Options display by pressing **Enter**.
5. Search the entries on the Log Analysis Report display for system reference codes associated with the missing disk units.
6. Go to the Reference codes topic and use the SRC information to correct the problem. **This ends the procedure.**

0024

The system type or system unique ID needs to be entered.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See “Performing an IPL to DST” on page 695.
2. When prompted, enter the correct system type or system unique ID. **This ends the procedure.**

0025

Hardware Resource Information Persistence disabled.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See “Performing an IPL to DST” on page 695.
2. Contact your next level of support for instructions on how to enable the Hardware Resource Information Persistence function. **This ends the procedure.**

0026

A disk unit is incorrectly configured for an LPAR system.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See “Performing an IPL to DST” on page 695.
2. On the Service Tools display, select **Start a Service Tool** → **Product activity log** → **Analyze log**.
3. On the Select Subsystem Data display, select the option to view All Logs.

Note: You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

4. Use the defaults on the Select Analysis Report Options display by pressing **Enter**.
5. Search the entries on the Log Analysis Report display for system reference codes (B6xx 53xx) that are associated with the error.
6. Using the SRC information, look up the reference code. and use the information to correct the problem. **This ends the procedure.**

0027

The user ASP has overflowed. Contact your next level of support.

0031

A problem was detected with the installation of Licensed Internal Code service displays. The cause may be defective media, the installation media being removed too early, a device problem or a Licensed Internal Code problem.

- Ask your next level of support for assistance. Characters 13-16 of the top 16 character line of function 12 (4 rightmost characters of word 3) contain information regarding the install error.
- If the customer does not require the service displays to be in the national language, you may be able to continue by performing another system IPL. **This ends the procedure.**

0033

System model not supported. This model of hardware does not support the System Licensed Internal Code version and release that is being used. Use a supported version and release of the System Licensed Internal Code.

0034

Insufficient main storage capacity.

There is not enough main storage capacity. For details about how much more capacity is required, see the “Insufficient Main Storage Capacity” screen, which is displayed when the system is IPLed in manual mode. Typically, this error occurs when you have moved memory between logical partitions, and one partition no longer has a sufficient amount of main storage.

0035

Data from a User ASP has overflowed into the System ASP (ASP 1). There is not enough free space in the User ASP to move the overflowed data from the System ASP back into the User ASP. The system will continue to run in this condition, but if a disk failure in the System ASP causes the System ASP to be cleared, the data in the User ASP will also be cleared out.

You should delete some files or objects from the User ASP so that enough free space exists in the User ASP to allow the data that is overflowed into the System ASP to be moved back.

0037

One or more functional connections to a disk unit in a multi-path environment have not been detected. The connections to the disk unit were established by running ESS Specialist. If you use the server in this state, you may cause a loss of data. You must ensure that all of the functional connections are still established between the disk and the Input/Output Adapters (IOAs) attached to this server and this logical partition. If there is an IOA which has a connection to the disk unit that has been moved to a different logical partition or different server, you should not continue with the IPL. Notify your next level of support.

0099

A Licensed Internal Code program error occurred. Ask your next level of support for assistance.

LICIP12

Use this procedure to isolate an Independent Auxiliary Storage Pool (IASP) vary on failure.

Message CPDB8E0 occurred if the user attempted to vary on the IASP. Read the **Danger** notices in "Licensed internal code (LIC) isolation procedures" on page 103 before continuing with this procedure.

How to find the cause code

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to "Determining if the system has logical partitions" on page 646 before continuing with this procedure.
2. Were you given a cause code by another procedure?
 - No:** Continue with the next step.
 - Yes:** Use the cause code given by the other procedure. Then go to step 4.
3. Look at the characters in word 3. You can obtain these characters by doing the following:
 - a. On the command line, enter the Start System Service Tools (**STRSST**) command. If you cannot get to SST, use function 21 to get to DST. Do not IPL the system to get to DST.
 - b. On the Start Service Tools Sign On display, type in a User ID with service authority and password.
 - c. Select **Start a Service Tool** → **Hardware Service Manager** → **Work with service action log**.
 - d. On the Select Timeframe display, change the From: Date and Time to a date and time prior to when the user attempted to vary on the IASP.
 - e. Search for a B6005094 system reference code that occurred at the time the user attempted to vary on the IASP. Display the failing item information for this entry.
 - f. Select the function key for **Additional details**.
 - g. The 4 leftmost characters of word 3 is the cause code to be used in this procedure.
4. Find the **cause code** below:

"0002" on page 121	"000A" on page 123	"002C" on page 123	"0030" on page 124
"0004" on page 122	"000B" on page 123	"002D" on page 123	"0032" on page 124
"0007" on page 122	"000D" on page 123	"002E" on page 124	"0099" on page 124

0002

Disk units are missing from the IASP disk configuration.

1. Have you installed a new disk enclosure in a disk unit and not restored the data to the disk unit?
 - **No:** Continue with the next step.
 - **Yes:** Ignore SRC A600 5094.

Continue with the disk unit exchange recovery procedure. **This ends the procedure.**

2. Use words 1-9 from the information in the Service Action Log to determine the disk unit that is missing from the configuration:
 - Word 4 contains the IOP direct select address.
 - Word 5 contains the unit address.
 - Word 6 contains the disk unit type, level and model number.
 - Word 7 contains the disk unit serial number.
 - Word 8 contains the number of missing disk units.

Are the problem disk units 432x, 660x, or 671x Disk Units?

- **Yes:** Continue with the next step.
 - **No:** Attempt to get all devices attached to the IOP to Ready status by performing the following:
 - a. The IOP address (IOP Direct Select Address) to use is Word 4.
 - b. Verify the following, and correct if necessary:
 - Ensure all cable connections are made correctly and are tight.
 - Ensure the configuration within the device is correct.
 - Ensure all storage devices are powered on and ready.
 - c. Continue with the next step.
3. Perform the following:

Select **System Service Tools (SST)** → **Work with disk units** → **Display disk configuration** → **Display disk configuration status**.

Are any disk units missing-indicated with an asterisk (*)- from the IASP configuration?

Yes: Continue with the next step.

No: **This ends the procedure.**

4. Use the Service Action Log to determine if there are any entries other than B6xx 5094 for the missing disk units or the IOA or IOP that is controlling them. See "Using the Service Action Log" on page 663.

Are there any entries in the Service Action Log other than B6xx 5094 for the missing disk units or the IOA or IOP that is controlling them?

No: Continue with the next step.

Yes: Use the information in the Service Action Log to solve the problem. See "Using the Service Action Log" on page 663. **This ends the procedure.**

5. Did you enter this procedure because there was a B6xx 5094 cause code of 0030?
 - **No:** Continue with the next step.
 - **Yes:** Work with the customer to recover the unknown configuration source disk unit.

Use a workstation with System i™ Navigator installed to select the disk pool with the problem, and then select **Recover unknown configuration source** for this disk pool. **This ends the procedure.**
6. Use Hardware Service Manager to display logical resources connected to the IOP. See "Hardware Service Manager" on page 701.
7. Is every device attached to the IOP failing?

- **Yes:** Continue with the next step.
 - **No:** Are all of the disk units that are attached to one IOA missing?
 - **No:** Continue with the next step.
 - **Yes:** Exchange the IOA. Use the IOP direct select address and the first character of the unit address from step 2 on page 121 to find the location. See Chapter 3, “Locating FRUs,” on page 347. **This ends the procedure.**
8. Is there more than one storage IOA attached to the IOP?
- **Yes:** Exchange the IOP. Use the IOP direct select address from step 2 on page 121 to find the location. See Chapter 3, “Locating FRUs,” on page 347. **This ends the procedure.**
 - **No:** Go to step 10.
9. Go to the service information for the specific disk unit that is listed below and perform the action indicated. Then return here and answer the following question.
- **2105 Disk Units:** Use SRC 3002 exchange the FRUs shown one at a time.
 - **432x, 660x, 671x Disk Units:** Use SRC 3002 and exchange the FRUs shown one at a time.
- Did the disk unit service information correct the problem?
- No:** Continue with the next step.
- Yes: This ends the procedure.**
10. Perform the following:
- a. Exchange the IOA. Use the IOP direct select address and the first character of the unit address from step 2 on page 121 to find the location. See Chapter 3, “Locating FRUs,” on page 347.
 - b. If exchanging the IOA does not correct the problem, exchange the IOP. Use the IOP direct select address from step 2 on page 121 to find the location. See Chapter 3, “Locating FRUs,” on page 347.
 - c. If exchanging the IOP does not correct the problem, exchange the failing items in the following FRU list starting with the first item in the list.
 - 1) FI01140
 - 2) System backplane
 - 3) FI00580
 - 4) AJDG301

This ends the procedure.

0004

Some disk units are unprotected but configured into a mirrored IASP. These units were originally DPY protected but protection was disabled.

Direct the customer to take the actions necessary to start protection on these disk units. **This ends the procedure.**

0007

Some of the configured disk units have device parity protection disabled when the system expected device parity protection to be enabled.

1. Select **Manual** mode and perform an IPL to DST. See “Performing an IPL to DST” on page 695.
2. Correct the problem by doing the following:
 - a. Select **Work with disk units** → **Work with disk unit recovery** → **Correct device parity protection mismatch**.
 - b. Follow the on-line instructions. **This ends the procedure.**

0008

A disk unit has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See “The System Reference Code (SRC) Format Description” on page 654.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.

432x 102E, 660x 102E, 671x 102E **This ends the procedure.**

0009

The procedure to restore a disk unit from the tape unit did not complete.

Continue with the disk unit exchange recovery procedure. **This ends the procedure.**

000A

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system.

Use the Service Action Log to find system reference codes associated with the missing disk units by changing the From: Date and Time on the Select Timeframe display to a date and time prior to when the user attempted to vary on the IASP. For information on how to use the Service Action Log, see “Using the Service Action Log” on page 663. **This ends the procedure.**

000B

Some system IOPs require cache storage be reclaimed.

1. Start SST.
2. Reclaim the cache adapter card storage by performing the following:
 - a. Select **Work with disk units** → **Work with disk unit recovery** → **Reclaim IOP Cache Storage**.
 - b. Follow the on-line instructions to reclaim cache storage.
 - c. After you complete the repair, the system operator may want to restore data from the most recently saved tape. **This ends the procedure.**

000D

The system disk capacity has been exceeded.

For more information about disk capacity, see the *iSeries Handbook*. **This ends the procedure.**

000E

Start compression failure.

1. Select **Manual** mode and perform an IPL to DST. See “Performing an IPL to DST” on page 695.
2. Correct the problem by doing the following:
 - a. Select **Work with disk units** → **Work with disk unit recovery** → **Recover from start compression failure**.
 - b. Follow the on-line instructions. **This ends the procedure.**

002C

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

002D

The IASP configuration source disk unit data is down-level.

The system is using the IASP configuration source disk unit that does **not** have the current level of data.

Work with the customer to recover the configuration. On a workstation with System i Navigator installed, select the disk pool with the problem, and then select **Recover configuration**. **This ends the procedure.**

002E

The Independent ASP is assigned to another system or a Licensed Internal Code program error occurred.

Work with the customer to check other systems to determine if the Independent ASP has been assigned to it. If the Independent ASP has not been assigned to another system, ask your next level of support for assistance. **This ends the procedure.**

002F

The system version and release are at a different level than the IASP version and release.

The system version and release must be upgraded to be the same as the system version and release in which the IASP was created. **This ends the procedure.**

0030

The mirrored IASP configuration source disk unit has a disk configuration status of *unknown* and is missing from the disk configuration.

Go to step 1 on page 121 for cause code 0002.

0032

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

0099

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

LICIP13

A disk unit seems to have stopped communicating with the system.

The system has stopped normal operation until the cause of the disk unit failure is found and corrected. Ensure you have read the **Danger** notices in “Licensed internal code (LIC) isolation procedures” on page 103 before continuing with this procedure.

If the disk unit that stopped communicating with the system has **mirrored protection active**, normal operation of the system stops for one to two minutes. Then the system suspends mirrored protection for that disk unit and continues normal operation.

Note: Do not power off the system or partition using the white button, function 08, ASMI, or HMC immediate power-off when performing this procedure. If this procedure or other isolation procedures referenced by this procedure direct you to IPL or power off the system,

- perform a partition main storage dump (see “Performing dumps” on page 710), or
- if additional dump information is not needed, perform a function 03 IPL or restart the system or partition using the HMC.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
2. Was a problem summary form completed for this problem?
No: Continue with the next step.
Yes: Use the problem summary form information and go to step 4.
3. Fill out a Problem Reporting Form ... completely with the instructions provided.
4. Recovery from a device command time-out may have caused the communications loss condition (indicated by an SRC on the control panel or in the HMC). This communications loss condition has the following symptoms:
 - The A6xx SRC does not increment within two minutes.
 - The system continues to run normally after it recovers from the communications loss condition and the reference code is cleared from the control panel.Does the communication loss condition have the above symptoms?
Yes: Continue with the next step.
No: Go to step 7.
5. Verify that all Licensed Internal Code PTFs have been applied to the system. Apply any Licensed Internal Code PTFs that have not been applied to the system. Does the intermittent condition continue?
Yes: Print all product activity logs. Print the LIC logs with a major code of 1000. Provide this information to your next level of support. **This ends the procedure.**
No: This ends the procedure.
6. Is the storage hosted by another partition?
Yes: Contact your next level of support.
No: Continue with the next step.
7. A manual reset of the IOP may clear the attention reference code. Perform the following:
If you are working from the control panel:
 - a. Select *Manual* mode on the control panel.
 - b. Select **Function 25** and press Enter.
 - c. Select **Function 26** and press Enter.
 - d. Select **Function 67** and press Enter to reset the IOP.
 - e. Wait 10 minutes.
 - f. Select **Function 25** and press Enter to disable the service functions on the control panel.**If you are working from the HMC:**
 - a. These need to be updated for the new HMC UI....
 - b. In the Navigation Area, open the Service Applications folder.
 - c. Select **Service Focal Point**.
 - d. In the contents area, select **Service Utilities**.
 - e. In the Service Utilities window, select the system you are working on.
 - f. Select **Selected** → **Operator Panel Service Functions**.
 - g. Select the logical partition, and then select **Partition Functions**.
 - h. Select **Disk Unit IOP Reset/Reload (67)**.
 - i. Wait 10 minutes.Did the reset successfully clear the control panel SRC or HMC panel value and can commands be entered on the partition console?
No: Continue with the next step.

Yes: Look for a Service Action Log (SAL) entry since the last IPL, and use it to fix the problem (see “Using the Service Action Log” on page 663). If a B6xx 5090 SRC occurred since the last IPL, look for other SRC entries and take action on them first. **This ends the procedure.**

8. Is the SRC the same reference code that sent you here?

Yes: The same reference code occurred. Continue with the next step.

No: Collect all words of the reference code and perform, problem analysis to resolve the new problem. **This ends the procedure.**

9. Powering off and powering on the affected IOP domain may clear the attention reference code. Perform the following:

If you are working from the control panel:

- Select *Manual* mode on the control panel.
- Select **Function 25** and press Enter.
- Select **Function 26** and press Enter.
- Select **Function 68** and press Enter to power off the domain.
- After the domain has been powered off or 10 minutes have passed, select **Function 69** and press Enter to power on the domain.
- Wait 10 minutes.
- Select **Function 25** and press Enter to disable the service functions on the control panel.

If you are working from the HMC:

- In the Navigation Area, open the Service Applications folder.
- Select **Service Focal Point**.
- In the contents area, select **Service Utilities**.
- In the Service Utilities window, select the system you are working on.
- Select **Selected** → **Operator Panel Service Functions**.
- Select the logical partition, and then select **Partition Functions**.
- Select **Power off domain** (68).
- After the domain has been powered off or 10 minutes have passed, select **Power on domain** (69).
- Wait 10 minutes.

Did this successfully clear the control panel SRC or HMC panel value, and can commands be entered on the partition console?

No: Continue with the next step.

Yes: Look for a SAL entry since the last IPL, and use it to fix the problem (see “Using the Service Action Log” on page 663). If a B6xx 5090 SRC occurred since the last IPL, look for other SRC entries and take action on them first. **This ends the procedure.**

10. Is the SRC the same reference code that sent you here?

Yes: The same reference code occurred. Continue with the next step.

No: Collect all words of the reference code and perform problem analysis to resolve the new problem. **This ends the procedure.**

11. Perform a main storage dump, then perform an IPL by performing the following:

If you are working from the control panel:

- Select *Manual* mode on the control panel.
- Select **Function 22** and press Enter to dump the main storage to the load-source disk unit.
- Wait for SRC A100 300x to occur, indicating that the dump is complete.
- Then perform an IPL to DST (see “Performing an IPL to DST” on page 695).

If you are working from the HMC:

- In the Navigation Area, open Server and Partition.

- b. Select **Server Management**.
 - c. In the contents area, open the server on which the logical partition is located.
 - d. Select **Partitions**.
 - e. Right-click the logical partition profile and select **Restart Partition**.
 - f. In the Restart Partition window, select the **Dump** restart option.
Does a different SRC occur, or does a display appear on the console showing reference codes?
 - No:** Continue with the next step.
 - Yes:** Perform problem analysis to correct the new problem. **This ends the procedure.**
12. Does the same reference code occur?
 - **Yes:** Continue with the next step.
 - **No:** The problem is intermittent. Perform the following:
 - a. Print the system product activity log for the magnetic storage subsystem and print the LIC logs with a major code of 1000.
 - b. Copy the main storage dump to removable media (see “Managing dumps” on page 710).
 - c. Contact your next level of support and provide them with this information. **This ends the procedure.**
 13. Are characters 7-8 of the top 16 character line of function 12 (2 rightmost characters of word 2) equal to 13 or 17?
 - Yes:** Continue with the next step.
 - No:** Go to step 16.
 14. Use the word 1 through 9 information recorded on the Problem summary form to determine the disk unit that stopped communicating with the system:
 - Characters 9-16 of the top 16 character line of function 12 (word 3) contain the IOP direct select address.
 - Characters 1-8 of the bottom 16 character line of function 12 (word 4) contains the unit address.
 - Characters 1-8 of the top 16 character line of function 13 (word 6) may contain the disk unit type, level and model number.
 - Characters 13-16 of the top 16 character line of function 13 (4 rightmost characters of word 7) may contain the disk unit reference code.
 - Characters 1-8 of the bottom 16 character line of function 13 (word 8) may contain the disk unit serial number.

Note: For 2105 and 2107 disk units, characters 4-8 of the bottom 16 character line of function 13 (5 rightmost characters of word 8) contain the disk unit serial number.
 15. Is the disk unit reference code 0000?
 - **No:** Using the information from step 14, find the table for the indicated disk unit type. Perform problem analysis for the disk unit reference code. **This ends the procedure.**
 - **Yes:** Perform the following steps:
 - a. Determine the IOP type by using characters 9-12 of the bottom 16 character line of function 13 (4 leftmost characters of word 9).
 - b. Find the unit reference code table for the IOP type. Determine the unit reference code by using characters 13-16 of the bottom 16 character line of function 13 (4 rightmost characters of word 9).
 - c. Perform problem analysis for the unit reference code. **This ends the procedure.**
 16. Are characters 7-8 of the top 16 character line of function 12 (the two rightmost characters of word 2) equal to 27?
 - Yes:** Continue with the next step.
 - No:** Go to step 20 on page 128.

17. Use the word 1 through 9 information recorded on the Problem summary form to determine the disk unit that stopped communicating with the system:
- Characters 9-16 of the top 16 character line of function 12 (word 3) contain the IOP direct select address.
 - Characters 1-8 of the bottom 16 character line of function 12 (word 4) contains the disk unit address
 - Characters 9-16 of the bottom 16 character line of function 12 (word 5) contains the disk unit type, level and model number.
 - Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit serial number.

Note: For 2105 and 2107 Disk Units, characters 4-8 of the bottom 16 character line of function 13 (5 rightmost characters of word 8) contain the disk unit serial number.

- Characters 13-16 of the bottom 16 character line of function 13 (4 rightmost characters of word 9) contain the disk unit reference code.

18. Is the disk unit reference code 0000?

- **No:** Continue with the next step.
- **Yes:** Find the table for the indicated disk unit type. Then find unit reference code (URC) 3002 in the table, and exchange the FRUs for that URC, one at a time.

Note: Do not perform any other isolation procedures that are associated with URC 3002.

This ends the procedure.

19. Are characters 9-16 of the bottom 16 character line of function 13 (word 9) B6xx 51xx?

Yes: Using the B6xx table, perform problem analysis for the 51xx unit reference code. **This ends the procedure.**

No: Using the information from step 17, find the table for the indicated disk unit type. Perform problem analysis for the disk unit reference code. **This ends the procedure.**

20. Are the 2 rightmost characters of word 2 on the Problem summary form equal to 62?

No: Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9) and use this information instead of the information in word 1 for the reference code. **This ends the procedure.**

Yes: Continue with the next step.

21. Are characters 9-16 of the top 16 character line of function 12 (word 3) equal to 00010004?

Yes: Continue with the next step.

No: Go to step 24 on page 129.

22. Are characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) equal to 0000?

No: Continue with the next step.

Yes: Go to step 25 on page 129.

23. Note the following:

- Characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) contain the disk unit reference code.
- Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit address.
- Characters 9-16 of the top 16 character line of function 13 (word 7) contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit type, level and model number.

Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 - 4 leftmost characters of word 8), and use characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) as the unit reference code. **This ends the procedure.**

24. Are characters 9-16 of the top 16 character line of function 12 (word 3) equal to 0002000D?
- **Yes:** Continue with the next step.
 - **No:** Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9), instead of the information in word 1 for the reference code, and perform problem analysis.
 - Characters 1-8 of the top 16 character line of function 13 (word 6) may contain the disk unit address.
 - Characters 9-16 of the top 16 character line of function 13 (word 7) may contain the IOP direct select address.
 - Characters 1-8 of the bottom 16 character line of function 13 (word 8) may contain the disk unit type, level and model number. **This ends the procedure.**
25. Note the following:
- Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit address.
 - Characters 9-16 of the top 16 character line of function 13 (word 7) contain the IOP direct select address.
 - Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit type, level and model number.

Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 (4 leftmost characters of word 8) and use 3002 as the unit reference code. Exchange the FRUs for URC 3002 one at a time. **This ends the procedure.**

LICIP14

Licensed Internal Code detected a card slot test failure.

1. Has the I/O adapter moved to a new card location?
 - **Yes:** Continue with the next step.
 - **No:** Go to step 4.
2. Perform one of the following, and then continue with the next step:
 - Use the concurrent maintenance option in Hardware Service Manager in SST/DST to power off, remove, reinsert, and power on the I/O adapter.
 - OR
 - Power off the system, remove and reinsert the I/O adapter. Then IPL the system.
3. Does the reference code occur again for this same I/O adapter?
 - **Yes:** Continue with the next step.
 - **No:** No further service action is needed.

This ends the procedure.
4. Move the I/O adapter to a different card location, that has no I/O processors in the PCI bridge set, by performing one of the following, and then continue with the next step:
 - Use the concurrent maintenance option in Hardware Service Manager in SST/DST to power off, remove the I/O adapter, install the I/O adapter in a different card location, and power on the I/O adapter. OR
 - Power off the system, remove the I/O adapter, install the I/O adapter in a different card location, and then IPL the system.
5. Does the same reference code occur again for this I/O adapter?
 - **Yes:** Replace the I/O adapter.

This ends the procedure.

 - **No:** Replace the backplane.

This ends the procedure.

LICIP15

Use this procedure to help you recover from an initial program load (IPL) failure.

1. Is the system HMC-managed or managed by Integrated Virtualization Manager (IVM)?
 - Yes:** Continue with the next step.
 - No:** Go to step 4.
2. Check the LPAR configuration to ensure that the load source and alternate load source devices are valid. Is the LPAR configuration correct?
 - Yes:** Continue with the next step.
 - No:** Correct the LPAR configuration problem. **This ends the procedure.**
3. Is the load source hosted by another partition?
 - Yes:** Contact your next level of support.
 - No:** Continue with the next step.
4. Did the failure occur when you were performing a type-D IPL?
 - **No:** Go to step 10 on page 131.
 - **Yes:** Perform the following:
 - a. Ensure that the device is ready and has valid install media.
 - b. Ensure that the device has the correct SCSI address and that any cables are properly connected and terminated.If a correction is made during the above checks, retry the IPL. If none of the above items resolve the problem, continue with the next step.
5. Are the load source and alternate load source devices controlled by the same I/O adapter, and does the load source disk unit have SLIC loaded on it?
 - Yes:** Continue with the next step.
 - No:** Go to step 7.
6. Perform a type-B IPL in manual mode. Does the same SRC occur?
 - **No:** Continue with the next step.
 - **Yes:** Replace the following items, one at a time, and retry the IPL until the problem is resolved (see Chapter 3, “Locating FRUs,” on page 347):
 - a. The I/O adapter controlling load source and alternate load source devices.
 - Note:** The I/O adapter may be embedded on the system unit backplane.
 - b. The common cable, if present, attached between both the load source and alternate load source and the controlling I/O adapter.
 - c. If none of the items above resolve the problem, contact your next level of support. **This ends the procedure.**
7. Replace the following items, one at a time, and retry the type-D IPL until the problem is resolved (see Chapter 3, “Locating FRUs,” on page 347):
 - a. Media in the alternate load source device
 - b. Device cables (if present)
 - c. Media device
 - d. Media backplane
 - e. I/O adapter controlling the alternate load source device
 - Note:** The I/O adapter may be embedded on the system unit backplane
 - f. If the problem persists after replacing each of these parts, contact your next level of support. **This ends the procedure.**

8. You performed a type A or type B IPL. Is the load source I/O adapter a Fibre Channel adapter?
- Yes:** Continue with the next step.
- No:** Continue with step 10.
9. Perform a type-D IPL in manual mode to DST. Look for other SRCs and use them to resolve the problem. If there are no SRCs, or if the SRCs do not resolve the problem, perform the actions for the 2847 3100 SRC. **This ends the procedure.**
10. Is the device in a valid location (see Chapter 3, “Locating FRUs,” on page 347)?
- Yes:** Continue with the next step.
- No:** Correct the device location problem and retry the IPL. If the problem persists, continue with the next step.
11. Perform a type-D IPL in manual mode to DST. Is the type-D IPL successful?
- **No:** Continue with the next step.
 - **Yes:** Look for other SRCs and use them to resolve the problem. If there are no SRCs, or the SRCs do not resolve the problem, replace the following items, one at a time, until the problem is resolved (see Chapter 3, “Locating FRUs,” on page 347):
 - a. Load source disk drive
 - b. Cables (if present)
 - c. Disk drive backplane
 - d. I/O adapter controlling the load source device
- Note:** The I/O adapter may be embedded on the system unit backplane
- e. Backplane that the I/O adapter is plugged into
 - f. If the problem persists after replacing each of these parts, contact your next level of support.
- This ends the procedure.**
12. The type-D IPL in manual mode to DST was not successful. Is the I/O adapter embedded on the system unit backplane?
- No:** Continue with the next step.
- Yes:** Replace the system unit backplane and retry the IPL. If the IPL still fails, contact your next level of support. **This ends the procedure.**
13. Are the load source and alternate load source controlled by the same I/O adapter?
- No:** Go to step 16 on page 132.
- Yes:** Continue with the next step.
14. Replace the I/O adapter and perform a type-A or type-B IPL. Does the IPL complete successfully?
- Yes: This ends the procedure.**
- No:** Continue with the next step.
15. Perform a type-D IPL in manual mode to DST. Is the type-D IPL successful?
- **No:** Continue with the next step.
 - **Yes:** Look for other SRCs and use them to resolve the problem. If there are no SRCs, or the SRCs do not resolve the problem, replace the following items, one at a time, until the problem is resolved (see Chapter 3, “Locating FRUs,” on page 347):
 - a. Load source disk drive
 - b. Cables (if present)
 - c. Disk drive backplane
 - d. I/O adapter controlling the load source device
- Note:** The I/O adapter may be embedded on the system unit backplane
- e. Backplane that the I/O adapter and I/O processor are plugged into

- f. If the problem persists after replacing each of these parts, contact your next level of support.

This ends the procedure.

16. Replace the backplane that the I/O adapter is plugged into and retry the IPL. If the IPL still fails, contact your next level of support. **This ends the procedure.**

LICIP16

Use this procedure to identify an adapter that is operational but is not located in the same partition as its associated adapter.

An adapter identified that its associated adapter is operational but is not located in the same partition. Use this procedure to identify the serial number and then find the location of the associated adapter and reassign it so that both adapters are in the same partition. Note: If the associated adapter is located in a different i5/OS partition, there might also be a B600690A logged against the associated adapter in that partition.

1. The adapter against which the B600690A is logged has identified that its associated adapter can not be found in this partition. Find the resource name that this error was logged against. This can be obtained from the Service Action Log (see "Using the Service Action Log"). Then, using the resource name, perform the following:
 - a. Access SST or DST.
 - b. Select **Start a Service Tool**.
 - c. Select **Hardware Service Manager**.
 - d. Select **Locate resource by resource name**.
 - e. Enter the resource name that this error was logged against.
 - f. Take the option to Display detail for the adapter.

2. The bottom of the resource detail screen displays any combination of the following information:

Attached storage IOA resource name. :
Attached storage IOA serial number. :
Attached storage IOA link status. . :

Or

Attached auxiliary IOA resource name:
Attached auxiliary IOA serial number:
Attached auxiliary IOA link status. . :

Or

Remote storage IOA resource name. . :
Remote storage IOA serial number. . :
Remote storage IOA link status. . . :

3. Using the serial number information displayed for the Attached or Remote IOA, have the customer determine which partition currently owns the adapter with that serial number by using logical resource or VPD utilities in each of the partitions on the system. Note: The CCIN of the associated adapter is the first four characters of word 6 of the SRC.
4. Then, have the customer ensure that both adapters are owned by the same partition. For further assistance, the customer should contact their software service provider. **This ends the procedure.**

Logical partition (LPAR) isolation procedure

These procedures help you to identify logical partition (LPAR) configuration conditions and the associated corrective actions.

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

“LPRIP01”

Use this procedure to isolate the problem when LPAR configuration data does not match the current system configuration.

LPRIP01

Use this procedure to isolate the problem when LPAR configuration data does not match the current system configuration.

1. Is there **only one** B6005311 error logged, and is it against the load source device for the partition, in either the Primary or a secondary partition?
 - **Yes:** Is the reporting partition the Primary partition?
 - **Yes:** Continue with the next step.
 - **No:** Go to step 3 on page 134.

- **No:** Go to step 4.
2. Was the load source disk unit migrated from another partition within the same system?
 - **Yes:** Is this load source device intended to be the load source for the Primary partition?
 - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions** → **Recover configuration data** → **Accept load source disk unit**. **This ends the procedure.**
 - **No:** Power off the system. Return the original load source disk to the Primary partition and perform a system IPL. **This ends the procedure.**
 - **No:** The load source disk unit has not changed. Contact your next level of support. **This ends the procedure.**
 3. The reporting partition is a secondary partition.
 Since the last IPL of the reporting partition, have one of the following occurred?
 - Has the Primary partition time/date been moved backward to a time/date earlier than the previous setting?
 - Has the system serial number been changed?
 - Was the load source disk unit in this secondary partition, replaced intentionally with a load source from another system or another partition from the same system?
 - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions** → **Recover configuration data** → **Accept load source disk unit**. **This ends the procedure.**
 - **No:** Contact your next level of support. **This ends the procedure.**
 4. Are there **multiple** B600 5311 SRCs logged in the same partition?
 - **Yes:** Continue with the next step.
 - **No:** None of the conditions in this procedure have been met, call your next level of support. **This ends the procedure.**
 5. Is the resource for **one** of the B600 5311 SRCs the load source device and are **all** of the other B600 5311 entries for resources which are non-configured disk units?

Note: To determine if a disk unit is a non-configured disk unit, refer to the "Work with disk unit options" section in the "DST options" section of the "DST chapter" in the *iSeries Service Functions* information.

 - **Yes:** Is the partition that is reporting the error the **Primary** partition?
 - **Yes:** Continue with the next step.
 - **No:** Go to step 7.
 - **No:** Go to step 8 on page 135.
 6. Was the load source disk unit migrated from another partition within the same system?
 - **Yes:** Is this load source device intended to be the load source for the Primary partition?
 - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions** → **Recover configuration data** → **Accept load source disk unit**. **This ends the procedure.**
 - **No:** Power off the system. Return the original load source disk to the Primary partition and perform a system IPL. **This ends the procedure.**
 - **No:** The load source disk unit has not changed. Contact your next level of support. **This ends the procedure.**
 7. The reporting partition is a secondary partition.
 Since the last IPL of the reporting partition, have one of the following occurred:
 - Has the Primary partition time/date been moved backward to a time/date earlier than the previous setting?
 - Has the system serial number been changed?

- Was the load source disk unit in this secondary partition, replaced intentionally with a load source from another system or another partition from the same system?
 - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions** → **Recover configuration data** → **Accept load source disk unit** **This ends the procedure.**
 - **No:** Contact your next level of support. **This ends the procedure.**
8. One or more B600 5311 SRCs have been logged in the same partition.
Do all of the B600 5311 errors have a resource which is a non-configured disk unit in the partition?
- Note:** To determine if a disk unit is a non-configured disk unit, refer to the "Work with disk unit options" section in the "DST options" section of the "DST chapter" in the *iSeries Service Functions* information.
- **Yes:** Continue with the next step.
 - **No:** None of the conditions in this procedure have been met, call your next level of support. **This ends the procedure.**
9. Were any disk unit resources associated with the B600 5311 SRCs added to the partition, since the last IPL of this partition?
- **No:** Continue with the next step.
 - **Yes:** Perform the following to clear non-configured disk unit configuration data:
 - a. Go to SST/DST in the partition and select **Work with system partitions** → **Recover configuration data** → **Clear non-configured disk unit configuration data**.
 - b. Select each unit in the list which is new to the system and press **Enter**.
 - c. Continue the system IPL. **This ends the procedure.**
10. None of the resources that are associated with the B600 5311 SRCs are disk units that were added to the partition since the last IPL of the partition.
Has a scratch install recently been performed on the partition that is reporting the error(s)?
- **No:** Continue with the next step.
 - **Yes:** Go to step 13.
11. If a scratch install was not performed, was the clear configuration data option recently used to discontinue LPAR use?
- **Yes:** Continue with the next step.
 - **No:** The **Clear configuration data** option was not used. Contact your next level of support. **This ends the procedure.**
12. Perform the following to clear non-configured disk unit configuration data:
- a. Go to SST/DST in the partition and select **Work with system partitions** → **Recover configuration data** → **Clear non-configured disk unit configuration data**.
 - b. Select each unit in the list which is new to the system and press **Enter**.
 - c. Continue the system IPL. **This ends the procedure.**
13. Was the load source device previously mirrored before the scratch install?
- **Yes:** Continue with the next step.
 - **No:** Go to step 15.
14. Perform the following to clear the old configuration data from the disk unit that was mirroring the old load source disk
- a. Go to SST/DST in the partition and select **Work with system partitions** → **Recover configuration data** → **Clear non-configured disk unit configuration data**.
 - b. Select the former load source mirror in the list and press **Enter**.
15. Is the Primary partition reporting the B600 5311 error(s)?
- **No:** **This ends the procedure.**

- **Yes:** Does the customer want multiple partitions on the system?
 - **No: This ends the procedure.**
 - **Yes:** Use the **Recover primary partition configuration data** option to retrieve the LPAR configuration data from other devices in the system.
 - a. Go to SST/DST in the primary partition and select **Work with system partitions** → **Recover configuration data** → **Recover primary partition configuration data**. The system will perform an automatic IPL.
 - b. Verify the information that appears.
 - The device should be a former load source device from a secondary partition.
 - The time and date should reflect a time when that partition was active. It should be more recent than the last change to the logical partition configuration. **This ends the procedure.**

Operations Console isolation procedures

These procedures help you to isolate a failure with the Operations Console.

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

For direct cable only.

The following symptoms can be caused by Operations Console failing to connect:

- SRC A600 5008
- The status in the Operations Console window remains "Connecting console".

The following symptoms can be caused by a defective remote control panel cable:

- Remote control panel (hung) System control panel functions.
- SRC 0000 DDDD with attention light on the system panel.
- Remote control panel accepts mode selections, however the system does not respond.
- The remote control panel does not function.
- The status in the Operations Console window remains "Connecting console".

The following safety notices apply throughout this section.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion tower where the field-replaceable unit (FRU) is located before removing, exchanging, or installing a FRU.

“OPCIP03”

Use this procedure to isolate a bringup failure with Operations Console.

OPCIP03

Use this procedure to isolate a bringup failure with Operations Console.

DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

Use this procedure to isolate an Operations Console bringup failure when the SRC on the panel is A6xx5008 or B6xx5008. If you are not using the Operations Console, see A6005004. This procedure only works with cable-connected and LAN configurations. It is not valid for dial connected configurations.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determine if the system has logical partitions before continuing with this procedure.

2. Is the SRC on the panel A6xx5008 or B6xx5008?
 - **No: This ends the procedure.**
 - **Yes:** Are you connecting Operations Console using the ASYNC adapter?
 - Yes:** Continue with the next step.
 - No:** You are connecting using a LAN adapter. Go to step 6.
3. Are words 17, 18, and 19 all equal to 00000000?
 - **Yes:** Report the problem to your next level of support. **This ends the procedure.**
 - **No:** Is word 17 equal to 00000001?
 - No:** Continue with the next step.
 - Yes:** The ASYNC adapter was not detected. Ensure that the ASYNC adapter card is installed, or replace the IOA and try again. **This ends the procedure.**
4. Is word 17 equal to 00000002?
 - **Yes:** On the ASYNC adapter card that was found, no cable was detected. Word 18 contains the card position. Locate the ASYNC adapter card in this card position, and ensure that the external cable is attached. Install or replace the external cable. **This ends the procedure.**
 - **No:** Is word 17 equal to 00000003?
 - No:** Continue with the next step.
 - Yes:** The cable that was detected does not have the correct cable ID. Word 18 contains the card position. Word 19 contains the cable ID. Locate the ASYNC adapter card in this card position, and verify that the correct cable is attached, or replace the cable. **This ends the procedure.**
5. Is word 17 equal to 00000004?
 - No:** Report the problem to you next level of support. **This ends the procedure.**
 - Yes:** Operations Console failed to make a connection because the port is already being used. Word 18 contains the card position. Disconnect the active communications session and try using the resource again. **This ends the procedure.**
6. Are words 13, 14 and 15 all equal to 00000000?
 - **Yes:** Report the problem to you next level of support. **This ends the procedure.**
 - **No:** Is word 13 equal to 00000002?
 - No:** Continue with the next step.
 - Yes:** The LAN hardware failed to activate. Replace the LAN IOA being used. **This ends the procedure.**
7. Is word 13 equal to 00000003?
 - **No:** Continue with the next step.
 - **Yes:** A hardware error occurred. Word 14 contains the error code, (example: 53001A80). Word 15 contains the card position.
 - Is the error code equal to 53001A80?
 - Yes:** The network cable is not attached to the LAN adapter, the cable is defective, or the network is not operational. **This ends the procedure.**
 - No:** The LAN adapter hardware is not operational. Replace the hardware and try again. **This ends the procedure.**
8. Is word 13 equal to 00000004?
 - **Yes:** The console did not respond. Word 14 contains the number of attempts made. Word 15 contains the card position. The system is inserted into the network but there is no connection to the client (PC). Verify the configuration for the network at the system and client; verify the configuration of Operations Console. **This ends the procedure.**
 - **No:** Is word 13 equal to 00000005?
 - No:** Report the problem to your next level support. **This ends the procedure.**

Yes: IP information was received from the console. Word 14 contains the received IP address. Verify the configuration data for the client (PC) or verify the configuration for the network. **This ends the procedure.**

Power isolation procedures

Contains procedures for isolating a problem in the power system.

Some field replaceable units (FRUs) can be replaced with the unit powered on. Follow the instructions in Chapter 3, “Locating FRUs,” on page 347 when directed to remove, exchange, or install a FRU.

The following safety notices apply throughout the power isolation procedures. Please read all safety procedures before servicing the system and observe all safety procedures when performing a procedure.

DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

“Power problems” on page 142

Use the following table to find out how to begin analyzing a power problem.

“PWR1900” on page 152

Determine which procedure to use based on the model number.

“PWR1904” on page 153

A power supply or regulator overcurrent fault is occurring in the server.

“PWR1906” on page 155

The server detected an error in the power system.

“PWR1907” on page 158

A unit was dropped from the SPCN configuration.

“PWR1908” on page 159

A power supply fault or load fault has occurred in a 5088 or 0588 expansion unit.

“PWR1909” on page 161

A power supply load fault is occurring in a system expansion unit or I/O tower.

“PWR1911” on page 163

You are here because of a power problem on a dual line cord system. If the failing unit does not have a dual line cord, return to the procedure that sent you here or go to the next item in the FRU list.

“PWR1912” on page 169

The server detected an error in the power system.

“PWR1917” on page 170

This procedure is used to display or change the configuration ID.

“PWR1918” on page 172

A voltage regulator card might be failing.

“PWR1920” on page 173

Use this procedure to verify that the lights on the server control panel and the display panel on all attached I/O expansion units are operating correctly.

Power problems

Use the following table to find out how to begin analyzing a power problem.

Table 22. Analyzing power problems

Symptom	What you should do
System unit does not power on.	See “Cannot power on system unit.”
The processor or I/O expansion unit does not power off.	See “Cannot power off system or SPCN-controlled I/O expansion unit” on page 145.
The system does not remain powered on during a loss of incoming ac voltage and has an Uninterruptible Power Supply (UPS) installed.	Refer to the UPS user’s guide that came with your unit.
An I/O expansion unit does not power on.	See “Cannot power on SPCN-controlled I/O expansion unit” on page 147.

“Cannot power on system unit”

Perform this procedure until you correct the problem and you can power on the system.

“Cannot power off system or SPCN-controlled I/O expansion unit” on page 145

Use this procedure to analyze a failure of the normal command and control panel procedures to power off the system unit or an SPCN-controlled I/O expansion unit.

“Cannot power on SPCN-controlled I/O expansion unit” on page 147

You are here because an SPCN-controlled I/O expansion unit cannot be powered on, and might be displaying a 1xxx-C62E reference code.

Cannot power on system unit

Perform this procedure until you correct the problem and you can power on the system.

Please see “Power isolation procedures” on page 141 for important safety information before continuing with this procedure.

1. Attempt to power on the system. Does the system power on, and is the system power status indicator light on continuously?

Note: The system power status indicator blinks at the slower rate (one blink per two seconds) while powered off, and at the faster rate (one blink per second) during a normal power-on sequence.

No: Continue with the next step.

Yes: Go to step 16 on page 145.

2. Are there any characters displayed on the control panel (a scrolling dot may be visible as a character)?

No: Continue with the next step.

Yes: Go to step 5.

3. Are the mainline ac power cables from the power supply, power distribution unit, or external uninterruptible power supply (UPS) to the customer's ac power outlet connected and seated correctly at both ends?

Yes: Continue with the next step.

No: Connect the mainline ac power cables correctly at both ends and go to step 1 on page 142.

4. Perform the following:

- Verify that the UPS is powered on (if it is installed). If the UPS will not power on, follow the service procedures for the UPS to ensure proper line voltage and UPS operation.
- Disconnect the mainline ac power cable or ac power jumper cable from the system's ac power connector at the system.
- Use a multimeter to measure the ac voltage at the system end of the mainline ac power cable or ac power jumper cable.

Note: Some system models have more than one mainline ac power cable or ac power jumper cable. For these models, disconnect all the mainline ac power cables or ac power jumper cables and measure the ac voltage at each cable before continuing with the next step.

Is the ac voltage from 200 V ac to 240 V ac?

No: Go to step 11 on page 144.

Yes: Continue with the next step.

5. Perform the following:

- Disconnect the mainline ac power cable(s) from the power outlet.
- Exchange the system unit control panel.
- Reconnect the mainline ac power cables to the power outlet.
- Attempt to power on the system.

Does the system power on?

No: Continue with the next step.

Yes: The system unit control panel was the failing item. **This ends the procedure.**

6. Perform the following:

- Disconnect the mainline ac power cable(s) from the power outlet.
- Exchange the power supply or supplies.
- Reconnect the mainline ac power cables to the power outlet.
- Attempt to power on the system.

Does the system power on?

No: Continue with the next step.

Yes: The power supply was the failing item. **This ends the procedure.**

7. Perform the following:

- Disconnect the mainline ac power cable(s).
- Replace the FSP card in the primary processor enclosure.
- Reconnect the mainline ac power cables to the power outlet.
- Attempt to power on the system.

Does the system power on?

No: Continue with the next step.

Yes: The FSP card was the failing item. **This ends the procedure.**

8. Perform the following:

- a. Disconnect the mainline ac power cable(s).
- b. Replace the FSP card in the first secondary processor enclosure.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system.

Does the system power on?

No: Continue with the next step.

Yes: The FSP card was the failing item. **This ends the procedure.**

9. Perform the following:

- a. Disconnect the mainline ac power cable(s).
- b. Replace the I/O backplane in the primary processor enclosure.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system.

Does the system power on?

No: Continue with the next step.

Yes: The I/O backplane was the failing item. **This ends the procedure.**

10. Perform the following:

- a. Disconnect the mainline ac power cable(s).
- b. Replace the I/O backplane in the first secondary processor enclosure.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system.

Does the system power on?

No: Contact your next level of support.

Yes: The I/O backplane was the failing item. **This ends the procedure.**

11. Are you working on a system unit with a power distribution unit with tripped breakers?

- **No:** Continue with the next step.
- **Yes:** Perform the following:
 - a. Reset the tripped power distribution breaker.
 - b. Verify that the removable ac power cable is not the problem. Replace the cord, as installed, if it is defective.
 - c. If the breaker continues to trip, install a new power supply (as installed) in each location until the defective one is found. **This ends the procedure.**

12. Does the system have an external UPS installed?

Yes: Continue with the next step.

No: Go to step 14.

13. Use a multimeter to measure the ac voltage at the external UPS outlets. Is the ac voltage from 200 V ac to 240 V ac?

No: The UPS needs service. For 9910 type UPS, call IBM® Service Support. For all other UPS types, have the customer call the UPS provider. In the meantime, go to step 15 on page 145 to bypass the UPS.

Yes: Exchange the ac power cable, as installed. **This ends the procedure.**

14. Perform the following:

- a. Disconnect the mainline ac power cable from the customer's ac power outlet.
- b. Use a multimeter to measure the ac voltage at the customer's ac power outlet.

Note: Some system models have more than one mainline ac power cable. For these models, disconnect all the mainline ac power cables and measure the ac voltage at all ac power outlets before continuing with this step.

Is the ac voltage from 200 V ac to 240 V ac?

Yes: Exchange the mainline ac power cable. Then go to step 1 on page 142.

No: Inform the customer that the ac voltage at the power outlet is not correct. When the ac voltage at the power outlet is correct, reconnect the mainline ac power cables to the power outlet. **This ends the procedure.**

15. Perform the following to bypass the UPS unit:

- a. Power off your system and the UPS unit.
- b. Remove the signal cable used between the UPS and the system.
- c. Remove any power jumper cords used between the UPS and the attached devices.
- d. Remove the country or region specific power cord used from the UPS to the wall outlet.
- e. Use the correct power cord (the original country or region specific power cord shipped with your system) and connect it to the power inlet on the system. Plug the other end of this cord into a compatible wall outlet.
- f. Attempt to power on the system.

Does the power-on standby sequence complete successfully?

Yes: This ends the procedure.

No: Go to step 5 on page 143.

16. Display the selected IPL mode on the system unit control panel. Is the selected mode the same mode that the customer was using when the power-on failure occurred?

No: Go to step 18.

Yes: Continue with the next step.

17. Is a function 11 reference code displayed on the system unit control panel?

No: Go to step 19.

Yes: Perform problem analysis using the reference code. **This ends the procedure.**

18. Perform the following:

- a. Power off the system.
- b. Select the mode on the system unit control panel that the customer was using when the power-on failure occurred.
- c. Attempt to power on the system.

Does the system power on?

Yes: Continue with the next step.

No: Exchange the system unit control panel. **This ends the procedure.**

19. Continue the IPL. Does the IPL complete successfully?

Yes: This ends the procedure.

No: Perform problem analysis using the information from the failed IPL. **This ends the procedure.**

Cannot power off system or SPCN-controlled I/O expansion unit

Use this procedure to analyze a failure of the normal command and control panel procedures to power off the system unit or an SPCN-controlled I/O expansion unit.

Attention: To prevent loss of data, ask the customer to verify that no interactive jobs are running before you perform this procedure.

Please see "Power isolation procedures" on page 141 for important safety information before continuing with this procedure.

1. Is the power off problem on the system unit?
No: Continue with the next step.
Yes: Go to step 3.
2. Ensure that the SPCN cables that connect the units are connected and seated correctly at both ends. Does the unit power off, and is the power indicator light blinking slowly?
Yes: This ends the procedure.
No: Go to step 7.
3. Attempt to power off the system. Does the system unit power off, and is the power indicator light blinking slowly?
No: Continue with the next step.
Yes: The system is not responding to normal power off procedures which could indicate a Licensed Internal Code problem. Contact your next level of support. **This ends the procedure.**
4. Attempt to power off the system using ASMI. Does the system power off?
Yes: The system is not responding to normal power off procedures which could indicate a Licensed Internal Code problem. Contact your next level of support. **This ends the procedure.**
No: Continue with the next step.
5. Attempt to power off the system using the control panel power button. Does the system power off?
Yes: Continue with the next step.
No: Go to step 10.
6. Is there a reference code logged in either ASMI, the control panel or the HMC that indicates a power problem?
Yes: Perform problem analysis for the reference code in the log. **This ends the procedure.**
No: Contact your next level of support. **This ends the procedure.**
7. Is the I/O expansion unit that will not power off part of a shared I/O tower loop?
Yes: Go to step 9.
No: Continue with the next step.
8. Attempt to power off the I/O expansion unit. Were you able to power off the expansion unit?
Yes: This ends the procedure.
No: Go to step 10.
9. The unit will only power off under certain conditions:
 - If the unit is in private mode, it should power off with the system unit that is connected by the SPCN frame-to-frame cable.
 - If the unit is in switchable mode, it should power off if the "owning" system is powered off or is powering off, and the system unit that is connected by the SPCN frame-to-frame cable is powered off or is powering off.Does the I/O expansion unit power off?
No: Continue with the next step.
Yes: This ends the procedure.
10. Ensure there are no jobs running on the system or partition, and verify that uninterruptible power supply (UPS) is not powering the system or I/O expansion unit. Then continue with the next step.
11. Perform the following:
 - a. Remove the system or I/O expansion unit ac power cord from the external UPS or, if an external UPS is not installed, from the customer's ac power outlet. If the system or I/O expansion unit has more than one ac line cord, disconnect all the ac line cords.
 - b. Exchange the following FRUs one at a time.
If the system unit is failing:
 - 1) Power supply

- 2) I/O backplane
- 3) System control panel

If an I/O expansion unit is failing:

- 1) Each power supply
- 2) I/O backplane
- 3) I/O backplane in the unit preceding the unit that will not power off
- 4) SPCN frame-to-frame cable

This ends the procedure.

Cannot power on SPCN-controlled I/O expansion unit

You are here because an SPCN-controlled I/O expansion unit cannot be powered on, and might be displaying a 1xxx-C62E reference code.

Please see “Power isolation procedures” on page 141 for important safety information before continuing with this procedure.

1. Power on the system.
2. Starting from SPCN 0 or SPCN 1 on the system unit, go to the first unit in the SPCN frame-to-frame cable sequence that does not power on. Is the Data display background light on, or is the power-on LED blinking, or are there any characters displayed on the I/O expansion unit display panel?

Note: The background light is a dim (yellow) light in the Data area of the display panel.

Yes: Go to step 12 on page 149.

No: Continue with the next step.

3. Use a multimeter to measure the ac voltage at the customer’s ac power outlet.

Is the ac voltage from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

- **Yes:** Continue with the next step.
- **No:** Inform the customer that the ac voltage at the power outlet is not correct.

This ends the procedure.

4. Is the mainline ac power cable from the ac module, power supply, or power distribution unit to the customer’s ac power outlet connected and seated correctly at both ends?

- **Yes:** Continue with the next step.
- **No:** Connect the mainline ac power cable correctly at both ends.

This ends the procedure.

5. Perform the following:

- a. Disconnect the mainline ac power cable from the ac module, power supply, or power distribution unit.
- b. Use a multimeter to measure the ac voltage at the ac module, power supply, or power distribution unit end of the mainline ac power cable.

Is the ac voltage from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

No: Continue with the next step.

Yes: Go to step 7 on page 148.

6. Are you working on a power distribution unit with tripped breakers?

- **No:** Exchange the mainline ac power cable or power distribution unit (as installed).

This ends the procedure.

- **Yes:** Perform the following:

- a. Reset the tripped power distribution breaker.
- b. Verify that the removeable ac line cord is not the problem. Replace the cord, as installed, if it is defective.

c. Install a new power supply (as installed) in all power locations until the defective one is found.

This ends the procedure.

7. Does the unit you are working on have ac power jumper cables installed?

Note: The ac power jumper cables connect from the ac module, or the power distribution unit to the power supplies.

Yes: Continue with the next step.

No: Go to step 11 on page 149.

8. Are the ac power jumper cables connected and seated correctly at both ends?

- **Yes:** Continue with the next step.
- **No:** Connect the ac power jumper cables correctly at both ends.

This ends the procedure.

9. Perform the following:

- a. Disconnect the ac power jumper cables from the ac module, or power distribution unit.
- b. Use a multimeter to measure the ac voltage at the ac module or power distribution unit (that goes to the power supplies).

Is the ac voltage at the ac module and power distribution unit from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

- **Yes:** Continue with the next step.
- **No:** Exchange the following as they are installed (see Chapter 8, "Part Information," on page 741):
 - AC module
 - Power distribution unit

This ends the procedure.

10. Perform the following:

- a. Connect the ac power jumper cables to the ac module, or power distribution unit.
- b. Disconnect the ac power jumper cable at the power supplies.
- c. Use a multimeter to measure the voltage of the power jumper cables input to the power supplies.

Is the voltage 200 V ac to 240 V ac or 100V ac to 127 V ac for each power jumper cable?

- **No:** Exchange the power jumper cable.
- **Yes:** Exchange the following parts, as installed, one at a time:

a.

Table 23.

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

- b. Display unit
- c. Power supply 1
- d. Power supply 2
- e. Power supply 3

This ends the procedure.

11. Perform the following:
 - a. Disconnect the mainline ac power cable (to the expansion unit) from the customer's ac power outlet.
 - b. Exchange the following FRUs, one at a time:
 - Power supply.
 -

Table 24.

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

- c. Reconnect the mainline ac power cables (from the expansion unit) into the power outlet.
- d. Attempt to power on the system.

Does the expansion unit power on?

- **Yes:** The unit you exchanged was the failing item.

This ends the procedure.

- **No:** Repeat this step and exchange the next FRU in the list. If you have exchanged all of the FRUs in the list, ask your next level of support for assistance.

This ends the procedure.

12. Is there a reference code displayed on the display panel for the I/O unit that does not power on?
 - **Yes:** Continue with the next step.
 - **No:** Replace the following:

Table 25.

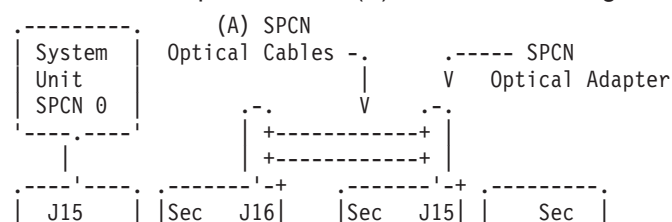
Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

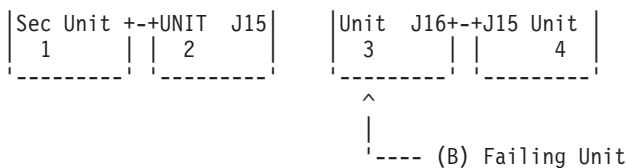
This ends the procedure.

13. Is the reference code 1xxx xx2E?
 - **Yes:** Continue with the next step.
 - **No:** Use the new reference code and perform problem analysis.

This ends the procedure.

14. Do the SPCN optical cables (A) connect the failing unit (B) to the preceding unit in the string or loop?

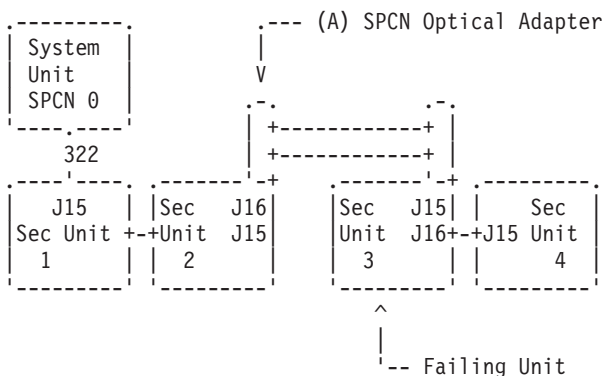




Yes: Continue with the next step.

No: Go to step 18 on page 151.

15. Remove the SPCN optical adapter (A) from the preceding frame in the string that cannot become powered on.



16. Perform the following:

Notes:

- The cable may be connected to either J15 or J16.
 - Use an insulated probe or jumper when performing the voltage readings.
- Connect the negative lead of a multimeter to the system frame ground.
 - Connect the positive lead of a multimeter to pin 2 of the connector from which you removed the SPCN optical adapter in the previous step of this procedure.
 - Note the voltage reading on pin 2.
 - Move the positive lead of the multimeter to pin 3 of the connector or SPCN card.
 - Note the voltage reading on pin 3.

Is the voltage on both pin 2 and pin 3 from 1.5 V dc to 5.5 V dc?

- Yes:** Continue with the next step.
- No:** Exchange the following:

Table 26.

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

This ends the procedure.

17. Exchange the following FRUs, one at a time):

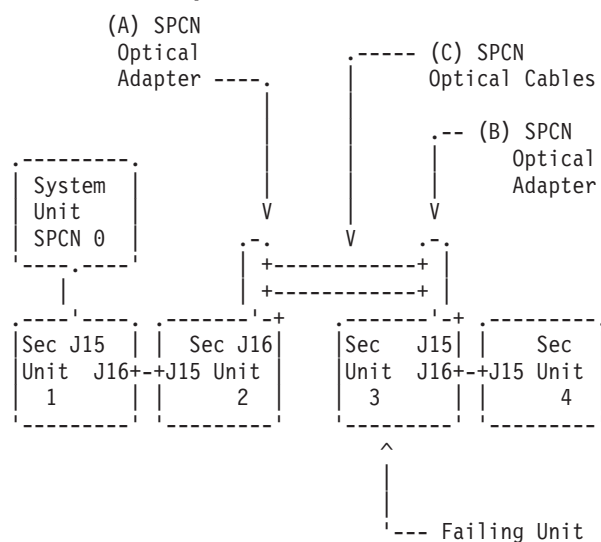
- a. In the failing unit (first frame with a failure indication), replace the following:

Table 27.

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

- b. In the preceding unit in the string, replace the FRU in Table 27.
- c. SPCN optical adapter (A) in the preceding unit in the string.
- d. SPCN optical adapter (B) in the failing unit.
- e. SPCN optical cables (C) between the preceding unit in the string and the failing unit.

This ends the procedure.



18. Perform the following:
 - a. Power off the system.
 - b. Disconnect the SPCN frame-to-frame cable from the connector of the first unit that cannot be powered on.
 - c. Connect the negative lead of a multimeter to the system frame ground.
 - d. Connect the positive lead of the multimeter to pin 2 of the SPCN cable.

Note: Use an insulated probe or jumper when performing the voltage readings.

- e. Note the voltage reading on pin 2.
- f. Move the positive lead of the multimeter to pin 3 of the SPCN cable.
- g. Note the voltage reading on pin 3.

Is the voltage on both pin 2 and pin 3 from 1.5 V dc to 5.5 V dc?

- **No:** Continue with the next step.
- **Yes:** Exchange the following FRUs one at a time:

- a. In the failing unit, replace the following:

Table 28.

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

- b. In the preceding unit in the string, replace the FRU in Table 28.
c. SPCN frame-to-frame cable.

This ends the procedure.

19. Perform the following:

- a. Follow the SPCN frame-to-frame cable back to the preceding unit in the string.
b. Disconnect the SPCN cable from the connector.
c. Connect the negative lead of a multimeter to the system frame ground.
d. Connect the positive lead of a multimeter to pin 2 of the connector.

Note: Use an insulated probe or jumper when performing the voltage readings.

- e. Note the voltage reading on pin 2.
f. Move the positive lead of the multimeter to pin 3 of the connector.
g. Note the voltage reading on pin 3.

Is the voltage on both pin 2 and pin 3 from 1.5 V dc to 5.5 V dc?

- **Yes:** Exchange the following FRUs one at a time:
a. SPCN frame-to-frame cable.
b. In the failing unit, replace the following:

Table 29.

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

- c. In the preceding unit in the string, replace the FRU in Table 29.

This ends the procedure.

- **No:** Exchange the FRU in Table 29 from the unit from which you disconnected the SPCN cable in the previous step of this procedure.

This ends the procedure.

PWR1900

Determine which procedure to use based on the model number.

Follow the instructions for the model or expansion unit you are servicing.

For Model MMA, perform "PWR1904" on page 153.

For 5094 and 5294 units, perform “PWR1906” on page 155.

For 5088 and 0588 units, perform “PWR1908” on page 159.

For 5095, 0595, 5790, 5796, 7314-G30, 7311-D11, and 7311-D20 units, perform “PWR1909” on page 161.

This ends the procedure.

PWR1904

A power supply or regulator overcurrent fault is occurring in the server.

Refer to “Power isolation procedures” on page 141 for important safety information before servicing the system.

Instructions for Model MMA

1. Is the reference code 1xxx 1C10, 1C11, 1C12, 1C13, 1C14, or 1C15?

Yes: Continue with the next step.

No: Go to step 5.

2. Is the reference code 1xxx 1C10, 1C11, 1C13, 1C14, or 1C15?

No: Continue with the next step.

Yes: Go to step 4.

3. Perform the following:

- a. Power off the system.

- b. Replace one of the memory DIMMs on the processor cards (see Chapter 3, “Locating FRUs,” on page 347).

- c. Power on the system.

- d. Has this resolved the problem?

No: Continue with step 3e.

Yes: This ends the procedure.

- e. Have you replaced all of the DIMMs?

No: Repeat step 3 and replace the next memory DIMM.

Yes: Go to step 4.

4. Perform the following:

- a. Power off the system.

- b. Replace one of the processor cards. For 1xxx 1C11 or 1C15, start with processor card 2. See Chapter 3, “Locating FRUs,” on page 347.

- c. Power on the system.

- d. Has this resolved the problem?

No: Continue with step 4e.

Yes: This ends the procedure.

- e. Have you replaced all of the processor cards?

No: Repeat step 4 and replace the next processor card.

Yes: Go to step 8 on page 154.

5. Perform the following:

- a. Power off the system and disconnect the ac power cable from the unit you are working on.

- b. Disconnect all of the I/O devices (tape, diskette, optical, and disk units) from the unit you are working on by sliding them partially out of the unit.

- c. Remove and label all cards (for example, PCI adapters, memory DIMMs, GX adapter(s), RIO/HSL and RAID cards if installed).

- d. Reconnect the ac power cable to the unit you are working on.
- e. Power on the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Go to step 10.

6. Perform the following:

- a. Power off the system.
- b. Replace one of the system fans (see Chapter 3, "Locating FRUs," on page 347).
- c. Power on the system.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** The fan you just replaced was the failing item.

This ends the procedure.

7. Have you tried replacing all of the fans?

- **Yes:** Reinstall all of the fans you replaced in step 6 and continue with the next step.
- **No:** Perform the following:
 - a. Power off the system.
 - b. Reinstall the fan that you just removed in step 6 to its original location.
 - c. Repeat step 6.

8. Perform the following:

- a. Power off the system.
- b. Replace one of the voltage regulator cards. See Chapter 3, "Locating FRUs," on page 347
- c. Power on the system.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** The voltage regulator card you just replaced was the failing item.

This ends the procedure.

9. Have you tried replacing all of the voltage regulator cards?

- **Yes:** Replace the regulator distribution connection backplane P2 (see Chapter 3, "Locating FRUs," on page 347). **This ends the procedure.**
- **No:** Perform the following:
 - a. Power off the system.
 - b. Reinstall the voltage regulator card that you just removed in step 8 to its original location.
 - c. Repeat step 8.

10. Perform the following:

- a. Power off the system.
- b. Reinstall all of the cards (PCI adapters, memory DIMMs, GX adapter(s), RIO/HSL and RAID cards) you removed in step 5 on page 153 to their original locations.
- c. Power on the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Go to step 13 on page 155.

11. Perform the following:

- a. Power off the system.
- b. Disconnect one of the cards you reinstalled in step 10.

c. Power on the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Exchange the last card you disconnected in this step (see Chapter 3, “Locating FRUs,” on page 347). **This ends the procedure.**

12. Have you disconnected all of the cards?

No: Repeat step 11 on page 154.

Yes: Reinstall all of the parts you have removed or exchanged in this procedure and perform problem analysis using the reference code. **This ends the procedure.**

13. Perform the following:

a. Power off the system.

b. Reconnect all of the I/O devices (tape, diskette, optical, and disk units) that you disconnected in step 5 on page 153.

c. Power on the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: The problem has been resolved. **This ends the procedure.**

14. Perform the following:

a. Power off the system.

b. Disconnect one of the I/O devices (tape, diskette, optical, and disk units) that you reconnected in step 13.

c. Power on the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Exchange the last I/O device you disconnected in this step (see Chapter 3, “Locating FRUs,” on page 347). **This ends the procedure.**

15. Have you tried disconnecting all of the I/O devices?

No: Repeat step 14.

Yes: Reinstall all of the parts you have removed or exchanged in this procedure and contact your next level of support. **This ends the procedure.**

PWR1906

The server detected an error in the power system.

Please see “Power isolation procedures” on page 141 for important safety information before servicing the system.

PWR1906 Instructions for 5094 and 5294 expansion units

1. Perform the following:

a. Power off the unit you are working on.

b. Disconnect all the I/O devices (tape, diskette, optical, and disk units) from the unit that you are working on by sliding them partially out of the unit. See the service guide for the unit you are servicing.

c. Remove and label all of the cards that are installed in the PCI card area.

d. Power on the unit you are working on.

Does a power reference code occur?

Yes: Continue with the next step.

No: Go to step 9 on page 157.

2. Perform the following:
 - a. Power off the unit you are working on.
 - b. Remove, in order, all power supplies except the first one (either P00 or P01 depending on the configuration).
 - c. Power on the unit you are working on.Does a power reference code occur?
 - Yes:** Continue with the next step.
 - No:** Go to step 4.
3. Perform the following:
 - a. Power off the unit you are working on.
 - b. Remove the power supply that was left installed in step 2.
 - c. Reconnect the next power supply in order (P01 or P02).
 - d. Power on the unit you are working on.Does a power reference code occur?
 - **Yes:** Go to step 5.
 - **No:** Exchange the power supply you removed in step 3b.**This ends the procedure.**
4. Perform the following:
 - a. Power off the unit you are working on.
 - b. Reconnect the next power supply in order.
 - c. Power on the unit you are working on.Does a power reference code occur?
 - **No:** Repeat this step until all power supplies have been reconnected.**This ends the procedure.**
 - **Yes:** Exchange the power supply that you reconnected in this step.**This ends the procedure.**
5. Perform the following:
 - a. Remove one of the fans from the unit you are working on that you did not previously remove during this procedure.

Note: Disregard a fan reference code if it occurs during this step.

 - b. Power on the unit you are working on.Does a power reference code occur?
 - **Yes:** Continue with the next step.
 - **No:** The fan that you removed in this step is the failing item.**This ends the procedure.**
6. Have you removed all of the fans, one at a time?
 - **Yes:** Install all of the fans and continue with the next step.
 - **No:** Perform the following:
 - a. Power off the unit you are working on.
 - b. Reinstall the fan that was removed in step 5 to its original location.
 - c. Repeat step 5.
7. Perform the following:
 - a. Remove the power cable (that was not previously removed) from one of the lower DASD device boards (CB1 or CB2).
 - b. Power on the unit you are working on.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** Replace the DASD device board that the power cable was removed from in this step.

This ends the procedure.

8. Is a second lower DASD backplane installed and its power cable connected?

- **Yes:** Repeat step 7 on page 156.
- **No:** Replace the following one at a time:
 - a. DASD upper device board (DB3)
 - b. I/O enclosure backplane (CB1).

This ends the procedure.

9. Perform the following:

- a. Power off the unit you are working on.
- b. Reinstall all of the cards that you removed in step 1 on page 155.
- c. Reconnect the ac power cable to the unit that you are working on.
- d. Power on the unit you are working on.

Does a power reference code occur?

Yes: Continue with the next step.

No: Go to step 12.

10. Perform the following:

- a. Power off the unit you are working on.
- b. Disconnect one of the cards that you connected in step 9.
- c. Power on the unit you are working on.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** Exchange the last card that you disconnected in this step.

This ends the procedure.

11. Have you disconnected all the cards?

Yes: Continue with the next step.

No: Repeat step 10.

12. Perform the following:

- a. Power off the unit you are working on.
- b. Reconnect all of the I/O devices (tape, diskette, optical, or disk units) that you disconnected in step 1 on page 155.
- c. Power on the unit you are working on.

Does a power reference code occur?

Yes: Continue with the next step.

No: This ends the procedure.

13. Perform the following:

- a. Power off the unit you are working on.
- b. If you have not already done so, disconnect all of the I/O devices (tape, diskette, optical, or disk units) that you reconnected in step 12.
- c. Reconnect one of the I/O devices (tape, diskette, optical, or disk units) that you just disconnected.
- d. Power on the unit you are working on.

Does a power reference code occur?

- **No:** Continue with the next step.

- **Yes:** Exchange the last I/O device that you reconnected in this step.
This ends the procedure.

14. Have you reconnected all the I/O devices?

Yes: This ends the procedure.

No: Repeat step 13 on page 157 (you can skip part b).

PWR1907

A unit was dropped from the SPCN configuration.

1. Is the reference code you are working with 1xxx 913B?

- **No:** Continue with the next step.
- **Yes:** A system power control network (SPCN) firmware update is needed, but not started due to the SPCN Firmware Update Policy setting. A manual update needs to be started:

Note: Do not perform maintenance on an expansion unit or modify the SPCN network while the SPCN firmware update is being performed.

Note: Performing firmware updates or powering off the system will interrupt SPCN firmware updates and the firmware update will need to be started again after these actions.

- Access the advanced system management interface (ASMI) and select **System Configuration** and then **Configure I/O Enclosures**.
- Record the current SPCN Firmware Update Policy setting so it can be restored later.
- Change the **SPCN Firmware Update Policy** setting to **Expanded** and click on **Save Policy Setting** to allow SPCN firmware updates to be done over the RIO/HSL and serial SPCN interfaces.
- Select **Start SPCN Firmware Update**. The SPCN firmware will now be downloaded to the expansion units that require an update.
- Change the SPCN Firmware Update Policy setting back to what it was originally set to in step 1b and click on **Save Policy Setting**.

Note: The SPCN firmware update can be stopped using the Stop SPCN Firmware Update button. However, to allow the expansion units to be updated to the latest SPCN firmware level, it is recommended that the firmware update be allowed to complete.

The progress of the SPCN firmware update can be monitored by clicking on **Configure I/O Enclosures** to update the screen. Do not use the browser Back or Refresh button to monitor the update progress. The Power Control Network Firmware Update Status column shows the percentage complete and In Progress is displayed while the download is progresses. Not Required is displayed when the download process completes.

This ends the procedure.

2. Is the reference code you are working with 1xxx 90F0?

- **No:** Contact your next level of support.
- **Yes:** A unit was dropped from the SPCN configuration.

This can be caused by any of the following:

- The rack or unit has lost all ac or dc power.
- The SPCN function in the unit has an error.
- The SPCN frame-to-frame cables, RIO cable or the remote I/O (RIO) adapter card has failed.

- Using the HMC or ASMI, find the 1xxx 90F0 SRC in the error log (see “Displaying error and event logs” on page 705). Use the *Show details* option to display the location information for the failing unit.
- After locating the failing unit, ensure that the SPCN frame-to-frame cable and RIO cables are seated correctly; reseal the cables if necessary.

- Are the cables connected correctly?
- **No:** Correctly reconnect the cables, or replace them if necessary. **This ends the procedure.**
 - **Yes:** Continue with the next step.
- Are the ac line cords on the failing unit connected properly at both ends?
 - **No:** Reconnect the ac line cords, or replace them if necessary. **This ends the procedure.**
 - **Yes:** Continue with the next step.
 - Check the voltage at the customer's ac outlet. Is the voltage correct?
 - **No:** Inform the customer that the voltage at the ac power outlet is incorrect. **This ends the procedure.**
 - **Yes:** Continue with the next step.
 - Are the power supplies functional?
 - **No:** Perform the following:
 - Refer to Chapter 3, "Locating FRUs," on page 347 to determine the location and part number for each power supply, and to find the appropriate procedure for exchanging the power supplies.
 - Replace each power supply, one at a time, until the problem has been resolved.
 - If the problem persists after replacing all of the power supplies, continue with the next step.
 - **Yes:** Continue with the next step.
 - Use the table below to determine the FRUs to replace. Refer to Chapter 3, "Locating FRUs," on page 347 for instructions on replacing FRUs. **This ends the procedure.**

Table 30.

Enclosure	FRU
5088, 0588	Tower backplane assembly
5094, 5294, 8094-002	Tower backplane assembly
5095, 0595	Tower backplane assembly
7311-D11, 7314-G30, 5790 or 5796	I/O backplane
7311-D20	I/O backplane

PWR1908

A power supply fault or load fault has occurred in a 5088 or 0588 expansion unit.

Please see "Power isolation procedures" on page 141 for important safety information before servicing the system. For location information, see the service guide for the enclosure you are working on.

PWR1908 instructions for 5088 or 0588 expansion units

Refer to Chapter 3, "Locating FRUs," on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

- Perform the following:
 - Power off the frame that you are working on by removing the jumper cable from the power supplies on the 5088 or 0588 expansion unit.
 - Remove and label all cards installed in the PCI backplane area.
 - Power on the frame by reconnecting the ac jumper cable to the unit.

Does a power reference code occur?

Yes: Continue with the next step.

No: Go to step 8 on page 161.

- Is the reference code 1xxx 2603?
 - **No:** Continue with the next step.

- **Yes:** Replace the PCI backplane.

This ends the procedure.

3. Perform the following:

- a. Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
- b. Remove power supply P01.
- c. Remove fan assembly B01 from power supply P01 and install it on a new power supply P01.
- d. Install the new power supply P01.
- e. Power on the frame by reconnecting the ac jumper cable to the unit you are working on.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** The power supply that you replaced in this step was the failing item.

This ends the procedure.

4. Perform the following:

- a. Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
- b. Remove the new power supply P01 and replace it with the original power supply P01.
- c. Remove power supply P02.
- d. Remove fan assembly B02 from power supply P02 and install it on a new power supply P02.
- e. Install the new power supply P02.
- f. Power on the frame by reconnecting the ac jumper cable to the unit you are working on.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** The power supply that you replaced in this step was the failing item.

This ends the procedure.

5. Perform the following:

- a. Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
- b. Remove both the new power supply P02 and the fan assembly B02.
- c. Reinstall the original power supply P02 and a new fan assembly B02.
- d. Power on the frame by reconnecting the ac jumper cable to the unit you are working on.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** The fan assembly B02 that you replaced in this step was the failing item.

This ends the procedure.

6. Perform the following:

- a. Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
- b. Remove power supply P02.
- c. Replace the new fan assembly B02 with the original fan assembly B02.
- d. Reinstall power supply P02.
- e. Remove power supply P01.
- f. Remove fan assembly B01 and replace it with a new fan assembly B01.
- g. Reinstall power supply P01.
- h. Power on the frame by reconnecting the ac jumper cable to the unit you are working on.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** The fan assembly B01 that you removed in this step is the failing item.

This ends the procedure.

7. Perform the following:

- Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
- Remove power supply P01.
- Replace fan assembly B01 with the original fan assembly B01.
- Reinstall power supply P01.
- Replace the following FRUs one at a time:
 - Display panel.
 - PCI backplane assembly CB1.

This ends the procedure.

8. Perform the following:

- Power off the frame you are working on by removing the ac jumper cable from the power supplies on the 5088 or 0588 expansion unit.
- Reinstall one of the cards that you removed in step 1 on page 159.
- Power on the frame by reconnecting the ac jumper cable to the unit you are working on.

Does a power reference code occur?

- **No:** Continue with the next step.
- **Yes:** Exchange the last card that you reinstalled in this step.

This ends the procedure.

9. Have you reinstalled all of the cards?

- **Yes:** Replace the PCI backplane assembly CB1.

This ends the procedure.

- **No:** Repeat step 8, reinstalling the next card.

PWR1909

A power supply load fault is occurring in a system expansion unit or I/O tower.

Please see “Power isolation procedures” on page 141 for important safety information before servicing the system.

Instructions for 5095, 0595, 5790, 5796, 7311-D11, 7311-D20 and 7314-G30

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

1. Perform the following:

- Power off the system.
- Disconnect all the I/O devices (tape, diskette, optical, and disk units) from the expansion unit or I/O tower you are working on by sliding them partially out of the unit.
- Remove and label all cards installed in the PCI card area.
- Power on the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Go to step 8 on page 162.

2. Perform the following:

- Power off the system.

- b. Remove one of the fans from the expansion unit or I/O tower that you have not previously removed during this procedure.

Note: Disregard a fan reference code if it occurs during this step.

- c. Power on the system.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** The fan you removed in this step is the failing item.

This ends the procedure.

3. Have you removed all of the fans one at a time?

- **No:** Perform the following:
 - a. Power off the system.
 - b. Reinstall the fan that you removed in step 2 on page 161 into its original location.
 - c. Repeat step 2 on page 161.
- **Yes:** Reinstall all of the fans and continue with the next step.

4. Perform the following:

Note: If there are no DASD installed in this enclosure, go to step 6.

- a. Power off the system.
- b. Remove the I/O tower power supply cable, at the DASD backplane, that you have not previously removed.
- c. Power on the system.

Does a power reference code occur?

- **No:** The DASD backplane that was disconnected in this step is the failing item.

This ends the procedure.

- **Yes:** Continue with the next step.

5. Have you disconnected the power cables from each of the DASD backplanes one at a time?

Yes: Continue with the next step.

No: Repeat step 4.

6. Perform the following:

- a. Power off the system.
- b. Remove a power supply that you have not previously removed, and replace it with a new one.
- c. Power on the system.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** The power supply that was removed in this step is the failing item.

This ends the procedure.

7. Have you removed all of the power supplies one at a time?

- **Yes:** Perform the following:
 - a. Remove the new power supply that you installed in step 6 and reinstall the original power supply.
 - b. Replace the I/O backplane if you are working on a 7311-D10, 7311-D11, 7314-G30, 5790 or 5796. Replace the tower backplane if you are working on a 5095 or 0595.

This ends the procedure.

- **No:** Remove the new power supply that you installed in step 6 and reinstall the original power supply. Then, repeat step 6.

8. Perform the following:

- a. Power off the system.
- b. Reinstall all of the cards you removed in step 1 on page 161.
- c. Power on the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Go to step 11.

9. Perform the following:

- a. Power off the system.
- b. Disconnect one of the cards you reconnected in step 8 on page 162.
- c. Power on the system.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** Exchange the last card you disconnected in this step (see Chapter 8, "Part Information," on page 741) Reinstall all the parts.

This ends the procedure.

10. Have you disconnected all the cards?

- **No:** Repeat step 9.
- **Yes:** Reinstall all the parts and perform problem analysis using the reference code.

This ends the procedure.

11. Perform the following:

- a. Power off the system.
- b. Reconnect all of the I/O devices (tape, diskette, optical, or disk units) that you disconnected in step 1 on page 161.
- c. Power on the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: This ends the procedure.

12. Perform the following:

- a. Power off the system.
- b. Disconnect one of the I/O devices you reconnected in step 11.
- c. Power on the system.

Does a power reference code occur?

- **Yes:** Continue with the next step.
- **No:** Exchange the last I/O device you disconnected in this step.

This ends the procedure.

13. Have you disconnected all of the I/O devices?

- **No:** Repeat step 12.
- **Yes:** Reinstall all the parts and contact your next level of support.

This ends the procedure.

PWR1911

You are here because of a power problem on a dual line cord system. If the failing unit does not have a dual line cord, return to the procedure that sent you here or go to the next item in the FRU list.

The following steps are for the system unit, unless other instructions are given. Please refer to "Power isolation procedures" on page 141 for important safety information before servicing the system.

1. If an uninterruptible power supply is installed, verify that it is powered on before proceeding.
2. Are all the units powered on?
 - **Yes:** Go to step 7 on page 165.
 - **No:** On the unit that does not power on, perform the following:
 - a. Disconnect the ac line cords from the unit that does not power on.
 - b. Use a multimeter to measure the ac voltage at the system end of both ac line cords.

Table 31. Correct ac voltage

Model or expansion unit	Correct ac voltage
5095, 0595, and 7311-D20 expansion units	100V to 127V or 200V to 240V
9117-MMA processor and 5796, 7314-G30 expansion units	200V to 240V
5088, 0588, 5094, 5294, 5790, and 7311-D11 expansion units	200V to 240V ac or dc

- c. Is the voltage correct (refer to Table 31)?
 - Yes:** Continue with the next step.
 - No:** Go to step 6 on page 165.
3. Are you working on a model 9117-MMA, 5095, 0595, 5790, 5796, 7314-G30, 7311-D11, or 7311-D20 ?
 - **No:** Continue with the next step.
 - **Yes:** Perform the following:
 - a. Reconnect the ac line cords.
 - b. Verify that the failing unit fails to power on.
 - c. Replace the failing power supply. Use the table below to determine which power supply needs replacing, and then see Chapter 3, "Locating FRUs," on page 347 for its location, part number, and exchange procedure.

Table 32. Failing power supply

Reference code	Models or expansion units	Failing item name
1510	9117-MMA	Power supply 1
	5095, 0595, 5790, 5796, 7314-G30, 7311-D11, 7311-D20	Power supply 1
1520	9117-MMA	Power supply 2
	5095, 0595, 5790, 5796, 7314-G30, 7311-D11, 7311-D20	Power supply 2

This ends the procedure.

4. Perform the following:
 - a. Reconnect the ac line cord to the ac modules.
 - b. Remove the ac jumper cables at the power supplies.
 - c. Use a multimeter to measure the ac voltage at the jumper cable power supply end.

Is the ac voltage from 200V to 240V?

 - **No:** Continue with the next step.
 - **Yes:** Replace the failing power supply. Use the table below to determine which power supply needs replacing, and then see Chapter 3, "Locating FRUs," on page 347 for its location, part number, and exchange procedure.

Attention: Do not install power supplies P00 and P01 ac jumper cables on the same ac module.

Table 33. Failing power supply

Reference code	Failing item name
1500	Power supply 0
1510	Power supply 1 for 5094 or 5294 Power supply 2 for 5088 or 0588
1520	Power supply 2 for 5094 or 5294 Power supply 1 for 5088 or 0588
1530	Power supply 3

This ends the procedure.

5. Perform the following:

- Disconnect the ac jumper cable at the ac module output.
- Use a multimeter to measure the ac voltage at the ac module output.

Is the ac voltage from 200V to 240V?

- **Yes:** Exchange the ac jumper cable.

This ends the procedure.

- **No:** Exchange the ac module (see Chapter 3, “Locating FRUs,” on page 347).

This ends the procedure.

6. Perform the following:

- Disconnect the ac line cords from the customer’s ac power outlet.
- Use a multimeter to measure the ac voltage at the customer’s ac power outlet.

Is the ac voltage correct (refer to Table 31 on page 164)?

- **Yes:** Exchange the failing ac line cord.

This ends the procedure.

- **No:** Perform the following:

- Inform the customer that the ac voltage at the power outlet is not correct.
- Reconnect the ac line cords to the power outlet after the ac voltage at the power outlet is correct.

This ends the procedure.

7. Is the reference code 1xxx-00AC?

- **No:** Continue with the next step.
- **Yes:** This reference code may have been caused by an ac outage. If the system will power on without an error no parts need to be replaced.

This ends the procedure.

8. Is the reference code 1xxx-1510 or 1520?

- **No:** Continue with the next step.
- **Yes:** Perform the following:
 - Use the following table, figures and Chapter 3, “Locating FRUs,” on page 347 to locate the failing parts.

Table 34. Power Reference Code Table

Model or expansion unit	Reference code	Locate these parts
9117-MMA	1xxx 1510	Power supply E1 and ac line cord 1
	1xxx 1520	Power supply E2 and ac line cord 2

Table 34. Power Reference Code Table (continued)

Model or expansion unit	Reference code	Locate these parts
5088 and 0588 (see Figure 2 on page 167)	1xxx 1510	ac jumper cable connected to power supply 2 and the ac module
	1xxx 1520	ac jumper cable connected to power supply 1 and the ac module
5294 and 5094 (see Figure 1)	1xxx 1500	ac jumper cable connected to power supply 0 and the ac module
	1xxx 1510	ac jumper cable connected to power supply 1 and the ac module
	1xxx 1520	ac jumper cable connected to power supply 2 and the ac module
	1xxx 1530	ac jumper cable connected to power supply 3 and the ac module
5095 and 0595	1xxx 1510	Power supply 1 and ac line cord 1
	1xxx 1520	Power supply 2 and ac line cord 2
5790, 5796, 7314-G30, 7311-D11, 7311-D20	1xxx 1510	Power supply E1 and ac line cord 1
	1xxx 1520	Power supply E2 and ac line cord 2

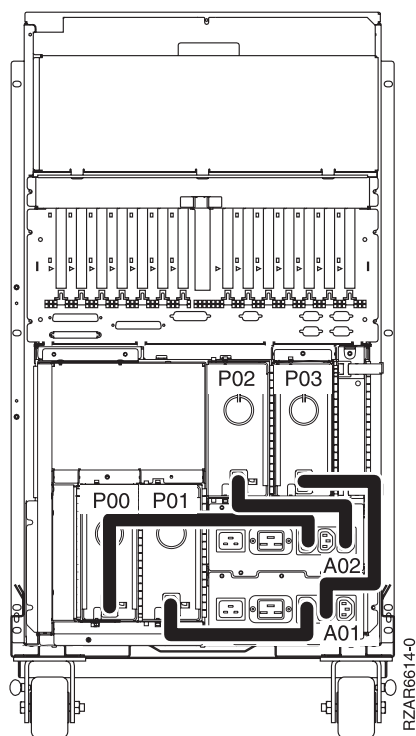


Figure 1. Dual line cord drawing for 5094

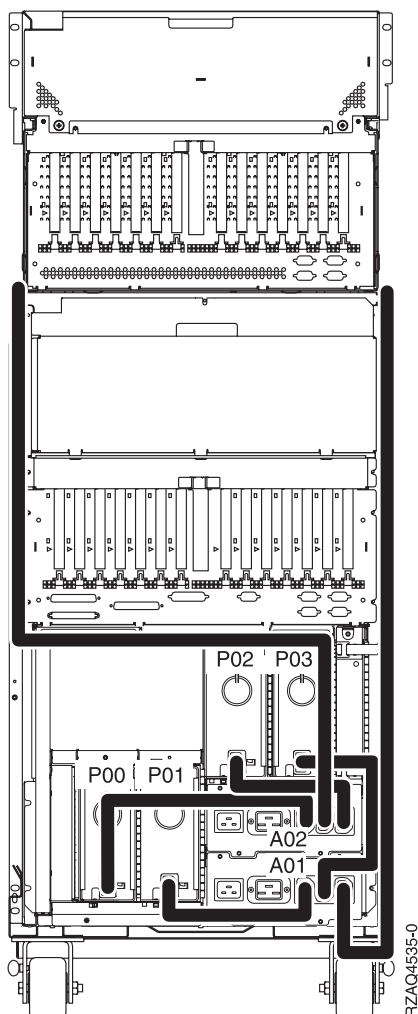


Figure 2. Dual line cord drawing for 5088, or 0588 installed on 5094

- b. Locate the ac line cord or the ac jumper cable for the reference code you are working on.
Attention: Do not disconnect the other system line cord when powered on.
 - c. Go to step 10.
9. Is the reference code 1xxx 1500 or 1xxx 1530?
 - **No:** Perform problem analysis using the reference code.
This ends the procedure.
 - **Yes:** Locate the ac jumper cables for the reference code you are working on (see Table 34 on page 165), and then continue with the next step:
Attention: Do not disconnect the other ac jumper cable when powered on.
 - If the reference code is 1xxx 1500, determine the locations of ac jumper cables that connect to power supply P00 (see the preceding figures).
 - If the reference code is 1xxx 1530, determine the locations of ac jumper cables that connect to power supply P03 (see the preceding figures).
10. Perform the following:
 - a. For the reference code you are working on, disconnect either the ac jumper cable or the ac line cord from the power supply.
 - b. Use a multimeter to measure the ac voltage at the power supply end of the ac jumper cable **or** the ac line cord.

Is the ac voltage correct (see Table 31 on page 164)?

No: Continue with the next step.

Yes: Exchange the failing power supply. Refer to Table 32 on page 164 and Table 33 on page 165 for its position, and then see Chapter 3, "Locating FRUs," on page 347 for part numbers and directions to the correct exchange procedures. **This ends the procedure.**

11. Perform the following:

- a. Disconnect the ac line cords from the power outlet.
- b. Use a multimeter to measure the ac voltage at the customer's ac power outlet.

Is the ac voltage correct (see Table 31 on page 164)?

- **Yes:** Exchange the following, one at a time:
 - failing ac line cord
 - failing ac jumper cable (if installed)
 - failing ac module (if installed) (see Chapter 3, "Locating FRUs," on page 347 for part numbers and directions to the correct exchange procedures)

This ends the procedure.

- **No:** Perform the following:
 - a. Inform the customer that the ac voltage at the power outlet is not correct.
 - b. Reconnect the ac line cords to the power outlet after the ac voltage at the power outlet is correct.

This ends the procedure.

PWR1912

The server detected an error in the power system.

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

1. Perform the following:
 - a. Ensure that both power line cords are properly connected.
 - b. Make sure that the unit EPO switch is in the *on* position.
 - c. Make sure that the unit EPO bypass switches on both bulk power controllers (BPCs) are in the *normal* position.
 - d. Ensure that the cable from unit EPO connector J00 to BPC-A connector J05 and the cable from unit EPO connector J01 to BPC-B connector J05 are secure and undamaged.
 - e. Ensure that the room temperature is not in excess of the maximum allowed (40° Celsius or 104° Fahrenheit).

Note: If the room temperature has exceeded the maximum allowed, the system may continually cycle on and off.

Were any problems discovered while performing the above checks?

No: Continue with the next step.

Yes: Correct any problems you found. **This ends the procedure.**

2. Make sure that the on/off switches on all the bulk power regulators (BPRs) are in the *on* (left) position.

Note: A switch set to the *off* position is not the cause of your problem, but they all need to be on before proceeding.

3. Check the state of the LEDs on both sides of the bulk power assembly (BPA) and then choose from the following conditions:

- If all of the LEDs on both sides of the BPA are in the *off* position, go to step 4.
- If the unit EPO power LED is turned on, the BPC **GOOD** LED is turned on, and all other LEDs are in the *off* position, go to step 5.
- If neither of the above two conditions is true, independent faults are indicated on both sides of the BPA. Each side must be isolated separately. Call your next level of support. **This ends the procedure.**

4. Prepare a voltage meter to measure up to 600 V ac. Using the labelled test points on the frame, measure the voltage between phase A and phase B. Is the voltage greater than 180 V ac?

Yes: Independent faults are indicated on both sides of the BPA. Each side must be isolated separately. Call your next level of support. **This ends the procedure.**

No: Inform the customer that power line voltage at the input to the BPR is missing or too low and needs to be corrected. **This ends the procedure.**

5. Is a cable connected to connector J02 on the unit EPO card?

No: Continue with the next step.

Yes: Go to step 7 to determine if the room EPO circuit is the problem.

6. Is the internal toggle switch on the unit EPO card set to the *RM EPO BYPASS* position?

No: Set the internal toggle switch on the unit EPO card to the *RM EPO BYPASS* position. **This ends the procedure.**

Yes: The unit EPO card is the failing item and needs to be replaced. **This ends the procedure.**

7. Unplug the cable from connector J02 on the EPO card and set the toggle switch to the *RM EPO BYPASS* position. Does the EPO **CMPLT** LED on at least one BPC become lit?

Yes: Inform the customer that the room EPO circuit is defective at this connection and requires service. **This ends the procedure.**

No: The unit EPO card is the failing item and needs to be replaced. **This ends the procedure.**

PWR1917

This procedure is used to display or change the configuration ID.

1. Use either the Advanced System Management Interface (ASMI) or the control panel to display and change the configuration ID.
 - If you are using the ASMI, refer to the operations guide for your system and use the instructions for *Changing system configuration*. Use Table 35 on page 171 to find the correct configuration ID.
 - If you are using the control panel, continue with the next step.

2. Perform the following to display the configuration ID:

Attention: The system or unit that will display the ID must be powered off with ac power applied.

Notes:

- If you have just restored power to the system, the service processor must return to standby before control panel functions will work correctly. Returning the service processor to standby takes a few minutes *after* the panel appears to be operational.
 - You must have the panel in manual mode to access function 7 options.
- a. Select function 07 on the system control panel. Press Enter (07** will be displayed).

- b. Use the arrow keys to increment or decrement to subfunction A8. 07A8 will be displayed. Press Enter (07A8 00 will be displayed).
- c. Use the arrow keys to increment or decrement to the first byte of the unit address (usually 3C) for the box you want to check. 07nn will be displayed, where nn is the first byte of the unit address.
- d. Press Enter (073C 00, for example, will be displayed).
- e. Use the arrow keys to increment or decrement to the second byte of the unit address (usually 01, 02, etc for I/O expansion units) for the box you want to check. 07nn will be displayed, where nn is the second byte of the unit address (0701, for example, for a unit). Press Enter (0701 00, for example, will be displayed).

Note: The display on the addressed I/O expansion unit being addressed should be blinking on and off while displaying the configuration ID as the last two characters of the bottom line.

- f. Use the following table to check the unit configuration ID.

Table 35. Unit Configuration IDs

Model or expansion unit	Configuration ID
5088 and 0588	89
5094 and 5294	8A
5095 and 0595	8B
7311-D11, 5790	88
7311-D20	8C
7314-G30, 5796	8D

- g. Is the correct configuration ID displayed for the tower selected?
 - **No:** Continue with the next step.
 - **Yes:** Go to step 6 on page 172.
3. You need to set the unit configuration ID. Are you starting this step from the function 01 view on the control panel?
 - **No:** To ensure that the control panel operates properly, return to function 01. Do the following:
 - a. The operator panel should still show the incorrect configuration ID (for example, 07C0).
 - b. Press Enter. The control panel will now show 07xx 00 (for example, 07C0 00).
 - c. Use the arrow keys to display 07**, then press Enter. The control panel will now show 07.
 - d. Use the arrow keys to get the display to function 01, then press Enter. You should now be at the regular function 01 control panel view.
 - e. Continue with the next step.
 - **Yes:** Continue with step 4.
4. Set the unit configuration ID. Do the following:
 - a. Select function 07 on the system control panel. Press Enter (07** will be displayed).
 - b. Use the arrow keys to increment/decrement to subfunction A9 (07A9 will be displayed). Press Enter (07A9 00 will be displayed).
 - c. Use the arrow keys to increment/decrement to the first byte of the unit address (usually 3C) for the box that you want to change. 07nn (073C, for example) will be displayed, where nn is the first byte of the unit address. Press Enter (073C 00, for example, will be displayed).
 - d. Use the arrow keys to increment/decrement to the second byte of the unit address (usually 01, 02, etc for I/O Expansion units) for the box you want to check. 07nn will be displayed, where nn is the second byte of the unit address (01, for example, for a unit). Press Enter (0701 00, for example, will be displayed).

Note: The display on the addressed I/O expansion unit will be blinking on and off.

- e. Use the arrow keys to increment/decrement to the correct configuration ID (refer to Table 35 on page 171). 07xx will be displayed where xx is the configuration ID.
- f. Press Enter (07xx 00 will be displayed). After 20 to 30 seconds, the display on the addressed I/O expansion unit will stop blinking and return to the normal display format.

Note: To return the panel to normal display, scroll to 07** and press Enter.

- g. Continue with the next step.
5. Power on the system. Do you still get SRC 1xxxx84D0 or 1xxxx840E?
 - **No: This ends the procedure.**
 - **Yes:** Continue with the next step.
6. Perform the following:
 - a. Power off the system.
 - b. Exchange the SPCN card in the failing frame. **This ends the procedure.**

PWR1918

A voltage regulator card might be failing.

PWR1918

Instructions for the 9117-MMA

Refer to Chapter 3, "Locating FRUs," on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

1. Is the reference code 1xxx 8450?
 - No:** Continue with the next step.
 - Yes:** You have fewer voltage regulator cards than processor cards. Add another regulator card in the next empty position. **This ends the procedure.**
2. Is the reference code 1xxx 8451?
 - No:** Continue with the next step.
 - Yes:** You have too few voltage regulator cards installed. Add another regulator card in the next empty position. **This ends the procedure.**
3. Is the reference code 1xxx 1611, 1612, or 1613?
 - No:** Continue with the next step.
 - Yes:** Voltage regulator 1 is the failing item and needs to be replaced. **This ends the procedure.**
4. Is the reference code 1xxx 1621, 1622, or 1623?
 - No:** Continue with the next step.
 - Yes:** Voltage regulator 2 is the failing item and needs to be replaced. **This ends the procedure.**
5. Is the reference code 1xxx 1631, 1632, or 1633?
 - No:** Continue with the next step.
 - Yes:** Voltage regulator 3 is the failing item and needs to be replaced. **This ends the procedure.**
6. Is the reference code 1xxx 2602?
 - Yes:** Continue with the next step.
 - No:** Perform problem analysis using the reference code. **This ends the procedure.**
7. Perform the following:
 - a. Remove one of the voltage regulator cards that you have not already removed in this procedure and replace it with a new one.
 - b. Power on the system (see "Powering on and powering off" on page 641).
Does reference code 1xxx 2602 appear again?

Yes: Continue with the next step.

No: The voltage regulator card that you replaced was the failing item. **This ends the procedure.**

8. Have you replaced all of the voltage regulator cards?

Yes: Replace the regulator distribution connection backplane (P2). **This ends the procedure.**

No: Reinstall the original regulator card, and then repeat step 7 on page 172.

PWR1920

Use this procedure to verify that the lights on the server control panel and the display panel on all attached I/O expansion units are operating correctly.

Please see “Power isolation procedures” on page 141 for important safety information before continuing with this procedure.

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

1. Activate the Lamp Test by performing ONE of the following:
 - Select function 04 **Lamp Test** on the control panel and press **Enter**.
 - Sign on to ASMI and go to *System Configuration -> Service Indicators -> Lamp Test*
2. Review the server control panel and the display panels on all attached I/O towers. The lamp test is only active on the I/O towers for 25 seconds after you press **Enter**. Check the following lights on at the control panel and all attached enclosures:
 - power-on light
 - attention light
 - all dots for the 32 character display

Are all lights on at the control panel and all attached I/O enclosures?

 - **No:** Go to step 4.
 - **Yes:** These control panel lights are working correctly. Continue with the next step.
3. Are any abnormal characters or character patterns (not reference codes or normal display mode) displayed?
 - **No:**
This ends the procedure.
 - **Yes:** Continue with the next step.
4. Verify that all cables are seated correctly. If the problem persists, replace the following field replaceable units in the failing enclosure one at a time:
 - Control panel
 - Service Processor or SPCN card
 - Control panel cable
 - The I/O backplane on which you previously replaced the service processor

This ends the procedure.

Router isolation procedures

These procedures serve as a guide to the correct isolation procedures from the reference code tables.

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

Perform these procedures only when directed to do so from another procedure.

“RTRIP01” on page 175

Gives a link to a topic that might assist you when exchanging the I/O processor (IOP) for the system or partition console of i5/OS™.

“RTRIP02” on page 175

Gives a link to a topic that might assist you when diagnosing workstation IOP detected errors.

“RTRIP03” on page 175

Gives links to topics to assist you when diagnosing workstation IOP detected errors.

“RTRIP04” on page 175

Use the FRU list in the service action log if it is available. If it is not available, examine word 5 of the reference code.

“RTRIP05” on page 180

Use the attached procedure when this reference code occurs for a RIO/HSL/12X loop resource, when an I/O expansion unit on the loop is powered off for a concurrent maintenance action.

“RTRIP06” on page 181

Use the attached procedure when this reference code occurs in a service action code (SAL).

“RTRIP07” on page 182

Gives a link to assist you when diagnosing a keyboard error.

“RTRIP08” on page 182

Gives a link to assist when the Licensed Internal Code detected an IOP programming problem.

RTRIP01

Gives a link to a topic that might assist you when exchanging the I/O processor (IOP) for the system or partition console of i5/OS™.

Perform “CONSL01” on page 32.

RTRIP02

Gives a link to a topic that might assist you when diagnosing workstation IOP detected errors.

Perform “TWSIP01” on page 256.

RTRIP03

Gives links to topics to assist you when diagnosing workstation IOP detected errors.

If you have a twinaxial terminal for the console, perform “TWSIP01” on page 256. Otherwise, perform “WSAIP01” on page 263.

RTRIP04

Use the FRU list in the service action log if it is available. If it is not available, examine word 5 of the reference code.

Is word 5 of the reference code zero (0000 0000)?

Yes: Perform “SIIOADP” on page 177.

No: Perform “PIOCARD.”

This ends the procedure.

“PIOCARD”

The hardware that controls PCI adapters and PCI card slots detected an error.

“SIIOADP” on page 177

SIIOADP: RIO adapter/HSL I/O bridge (in a system unit or I/O unit).

PIOCARD

The hardware that controls PCI adapters and PCI card slots detected an error.

The failing component is the adapter in the location specified by the Direct Select Address (DSA) in the reference code. When possible, the diagnostic code will determine the FRU location for the serviceable event view.

1. Are you working from the serviceable event view and a card location is listed with this FRU?

- **Yes:** The error is located at the listed card location. Go to step 5 on page 176.
- **No:** Perform the following:
 - a. Record the DSA, which is word 7 of the reference code.

- b. Locate the card specified in the DSA by going to “MABIP53” on page 51. Return here after locating the FRU and continue with the next step.
2. Did you identify a single FRU location by using “MABIP53” on page 51?

Yes: This is the location of the failing item. Go to step 5.

No: Continue with the next step.
3. Perform the following, referring to the remove and replace procedures for each FRU location you determined (you can find links to the locations information, and from there to the remove and replace procedures, in the table at the end of this procedure):
 - a. Remove all of the adapter and/or IOP cards in the locations that are identified in the given range of card slots. Do not remove any FRUs with embedded adapters, only FRUs in PCI card slots.
 - b. Replace each card one at a time.

Note: For i5/OS adapters controlled by IOPs, replace the IOP before any of the adapters. Power on the unit after you replace each card until either the problem reappears or you have replaced each card.
- c. Did the problem reappear?

Yes: The last card that you replaced before the problem appeared again is the failing item. **This ends the procedure.**

No: Continue with the next step.
4. Did you identify a FRU with embedded adapters when performing “MABIP53” on page 51?

Yes: The problem is in the FRU with the embedded adapter. Continue with the next step and exchange that FRU. **This ends the procedure.**

No: The problem may be intermittent. Contact your next level of support. **This ends the procedure.**
5. Use the table below to locate and replace the failing item. **This ends the procedure.**

Table 36. Failing item for symbolic FRU PIOCARD

System model, expansion unit, or machine type	Name of FRU to exchange	FRU location
9117-MMA and 9406-MMA	PCI adapter, if you have detected a failing PCI adapter in a PCI slot of a system unit drawer, replace the PCI adapter that is in the failing slot.	Un-P1-Cx
	I/O backplane, if you detected a failing I/O controller that is embedded on a system unit's I/O backplane, replace the I/O backplane.	Un-P1
7311-D11	PCI adapter, if you have detected a failing PCI adapter in a PCI slot of an I/O expansion drawer, replace the PCI adapter that is in the failing slot.	Un-P1-Cx
7311-D20	PCI adapter, if you have detected a failing PCI adapter in a PCI slot of an I/O expansion drawer, replace the PCI adapter that is in the failing slot.	Un-Px-Cy
7311-G30	PCI adapter, if you have detected a failing PCI adapter in a PCI slot of an I/O expansion drawer, replace the PCI adapter that is in the failing slot.	Un-Px-Cy

This ends the procedure.

SIIOADP

SIIOADP: RIO adapter/HSL I/O bridge (in a system unit or I/O unit).

Note: In the following procedures, the term *RIO adapter* refers to either a RIO adapter or an HSL I/O bridge, depending on the system you are working on.

1. Is a location for this FRU given in the serviceable event view?
 - **Yes:** Use that location and replace the failing part. Refer to Chapter 3, “Locating FRUs,” on page 347. **This ends the procedure.**
 - **No:** Continue with the next step.

Note: In most circumstances, the SRC logged by the system firmware calls out a FRU list. In very few circumstances (as in the following examples), the failure requires immediate system termination.

Example: Symptoms

```
1 B7006981 RIO/HSL (bridge) bus adapter failure SRC
2 XXXXX62 SRC Format 62
3 00010002 Component ID field must be an exact match
4 14993203 Code Model and PRC must be an exact match
5 FRUCALL0 Decode this when the SRC is 6906 or 6907
6 FRUCALL0 Decode this when the SRC is 6981
7 00000000
```

Example: SRC 6981

```
1 B7006981
2 00000062
3 00010002
4 14993203
6 00044000
7 00000000
```

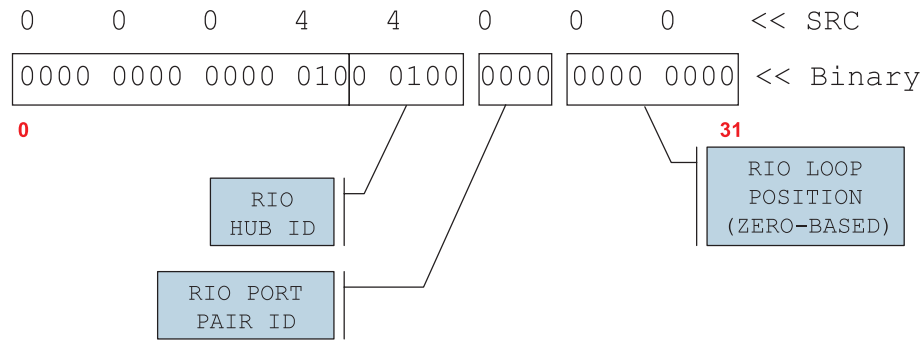
When immediate termination occurs, the SRC does not provide a FRU callout. The following steps describe how to determine the FRU callout.

2. Isolate the RIO adapter FRU indicated by the data in word 5 (when the SRC is 6906 or 6907) or word 6 (when the SRC is 6981) of the SRC by completing the following steps:

Note: Replace only the FRU with the RIO adapter FRU.

- a. Use the following example as a guide to locate and record the following binary values from word 5 or word 6 of the SRC:
 - RIO hub ID
 - RIO port pair ID
 - RIO loop position

Example: Decoding FRU Callout 00044000



IPHAU450-1

- b. Convert the binary values for the RIO hub ID, the RIO port pair ID, and the RIO loop position to decimal. Record these values for later use.
3. Each RIO hub controls two RIO loops, specified as the *first* and *second* loop. Use the following list to determine and record which of these two RIO loops is indicated in word 6 of the SRC:
 - When the binary value of the RIO port pair ID is 0000, the SRC indicates the **first** RIO loop
 - When the binary value of the RIO port pair ID is 0001, the SRC indicates the **second** RIO loop
4. To isolate the failing RIO adapter, you will walk the cabling for the specified RIO loop from the leading port to the trailing port. To determine the RIO loop number and RIO port location code for the leading port, do the following:
 - a. Make sure you have the following values at hand, then continue with the next step.
 - The decimal value for the RIO hub ID
 - The RIO loop indicated by the RIO port pair ID
 - b. Compare the values from the previous step to the location table (Table 37) and graphic below. Record the values for the RIO loop number and the RIO port location code. Then continue with the next step.
 - Chapter 3, “Locating FRUs,” on page 347

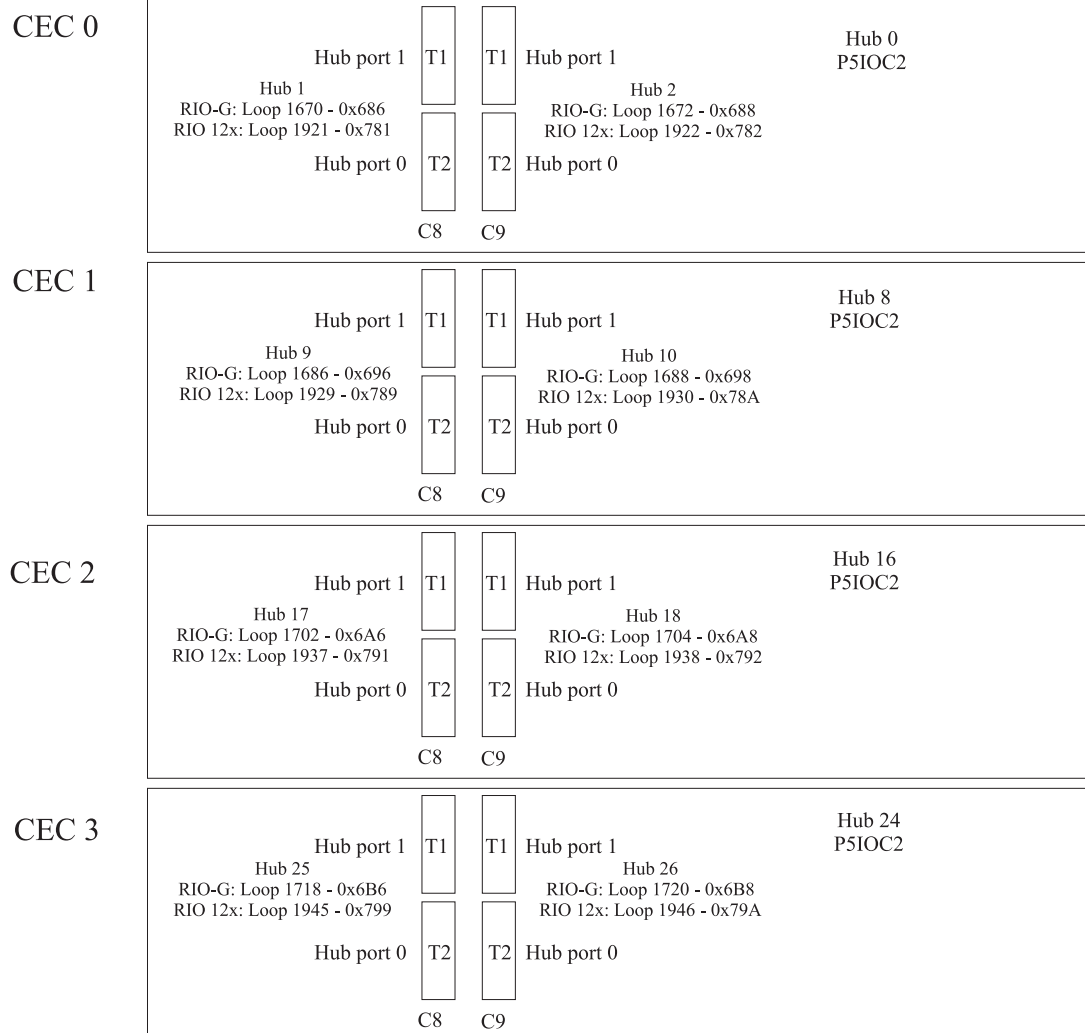
Table 37. Model MMA SIIOADP RIO loop location information

System Unit	Hub (decimal)	Hub loop	Loop number (hex / dec)	Location code for leading port of the loop
0	1	First	0686/1670	-P1-C8-T2
0	1	First	0781/1921	-P1-C8-T2
0	2	First	0688/1672	-P1-C9-T2
0	2	First	0782/1922	-P1-C9-T2
1	9	First	0696/1686	-P1-C8-T2
1	9	First	0789/1929	-P1-C8-T2
1	10	First	078A/1930	-P1-C9-T2
1	10	First	0698/1688	-P1-C9-T2
2	17	First	06A6/1702	-P1-C8-T2
2	17	First	0791/1937	-P1-C8-T2
2	18	First	06A8/1704	-P1-C9-T2
2	18	First	0792/1938	-P1-C9-T2
3	25	First	06B6/1718	-P1-C8-T2
3	25	First	0799/1945	-P1-C8-T2

Table 37. Model MMA SIIOADP RIO loop location information (continued)

System Unit	Hub (decimal)	Hub loop	Loop number (hex / dec)	Location code for leading port of the loop
3	26	First	06B8/1720	-P1-C9-T2
3	26	First	079A/1946	-P1-C9-T2

MLx



5. Isolate the failing RIO adapter by walking the cabling for the specified RIO loop from the leading port to the trailing port. Do the following:
 - a. Begin walking the cabling by starting at the RIO loop number and RIO port location code that you recorded in step 4b on page 178.
 - b. Starting with 0 (zero) for the first RIO adapter on the loop, follow the loop cabling and count each RIO adapter in the order it is cabled. For example, the first RIO adapter is 0, the next is 1, the next is 2, and so on.
 - c. Continue this process until you count up to the decimal value of the RIO loop position. The RIO adapter that corresponds to the value of the RIO loop position is the failing RIO adapter.

Note: **Concurrent maintenance** requires that you make a change to the previous procedure for counting the RIO adapters on the loop. If concurrent maintenance was performed to attach one or more additional RIO adapters to this loop and the server has not been IPL'ed after the adapters were added, then **exclude the added RIO adapters as you make the initial count**. If the RIO loop position exceeds the number of RIO adapters, continue by counting the added RIO adapters in the order they were added to the loop.

6. Exchange the failing RIO adapter. Refer to Chapter 3, "Locating FRUs," on page 347. **This ends the procedure.**

RTRIP05

Use the attached procedure when this reference code occurs for a RIO/HSL/12X loop resource, when an I/O expansion unit on the loop is powered off for a concurrent maintenance action.

Note: This reference code can occur for the RIO/HSL/12X loop resource when an I/O expansion unit on the loop is powered off for a concurrent maintenance action.

Note: A fiber optic cleaning kit may be required for optical RIO/HSL/12X connections.

1. Multiple B600 6982 errors may occur due to efforts to retry and recover. If the recovery efforts were successful, there will be a B600 6985 reference code with xxxx 3206 in word 4 logged after all B600 6982 reference codes in the product activity log (PAL). If this is the case, close out all the B600 6982 entries. Then continue with the next step.
2. Is there a B600 6987 reference code in the service action log (SAL) logged at about the same time?
Yes: Close this problem and work the B600 6987.
This ends the procedure.
No: Continue with the next step.
3. Is there a B600 6981 reference code in the SAL logged at approximately the same time?
Yes: Go to step 8 on page 181.
No: Continue with the next step.
4. Perform "RIOIP06" on page 38 to determine if any other systems are connected to this loop and then return here.

Note: The loop number can be found in the SAL in the description for the HSL_LNK FRU.
Are there other systems connect to this loop?

Yes: Continue with the next step.

No: Go to step 8 on page 181.

5. Check for HSL failures in the SALs on the other systems before replacing parts. HSL failures are indicated by SAL entries with HSL I/O bridge and Network Interface Controller (NIC) resources. Ignore B600 6982 and B600 6984 entries.

Are there HSL failures on other systems?

Yes: Continue with the next step.

No: Go to step 8 on page 181.

6. Repair the problems on the other systems and return to this step. After making repairs on the other systems check the PAL of this system. Is there a B600 6985, along with this loop's resource name, that was logged after the repairs you made on the other systems?

Yes: Continue with the next step.

No: Go to step 8 on page 181.

7. For the B600 6985 reference code you found, use "Status indications for RIO/HSL" on page 21 to determine if the loop is now complete.

Is the loop complete?

Yes: The problem has been resolved.

This ends the procedure.

No: Go to step 8.

8. The FRU list displayed in the SAL may be different from the failing item list given here. Use the SAL's FRU list when it is available.

Does this reference code appear in the SAL with the symbolic FRU HSL_LNK listed as a FRU?

Yes: Perform "RIOIP01" on page 33.

This ends the procedure.

No: Exchange the FRUs listed in the SAL according to their part action codes.

This ends the procedure.

RTRIP06

Use the attached procedure when this reference code occurs in a service action code (SAL).

Note: A fiber optic cleaning kit may be required for optical HSL connections.

1. Is the reference code in the service action log (SAL)?

- **Yes:** Continue with the next step.
- **No:** The reference code is informational. Use "Status indications for RIO/HSL" on page 21 to determine what the reference code means.

This ends the procedure.

2. This error can appear in the SAL if a tower or another system in the loop did not complete powering on before Licensed Internal Code (LIC) checked this loop for errors. Search the product activity log (PAL) for all B600 6985 reference codes logged for this loop and use "Status indications for RIO/HSL" on page 21 to determine if this error requires service.

Is further service required?

Yes: Continue with the next step.

No: **This ends the procedure.**

3. There may be multiple B600 6985 reference codes, with xxxx 3205 in word 4, for the same loop resource in the SAL. This is caused by attempts to retry and recover. If there is a B600 6985 reference code with xxxx 3206 or xxxx 3208 in word 4 after the above B600 6985 entries in the PAL, then the recovery efforts were successful. If this is the case, close all the B600 6985 entries for that loop resource in the SAL. Then continue with the next step.

4. Is there a B600 6981 reference code in the SAL?

Yes: Close that problem and go to step 9 on page 182.

No: Continue with the next step.

5. Perform "RIOIP06" on page 38 to determine if any other systems are connected to this loop and then return here.

Note: The loop number can be found in the SAL in the description for the HSL_LNK FRU.

Are there other systems connected to this loop?

Yes: Continue with the next step.

No: Go to step 9 on page 182.

6. Check for HSL failures in the SALs on the other systems before replacing parts. HSL failures are indicated by SAL entries with HSL I/O bridge and Network Interface Controller (NIC) resources. Ignore B600 6982 and B600 6984 entries.

Are there HSL failures on other systems?

Yes: Continue with the next step.

No: Go to step 9 on page 182.

7. Repair the problems on the other systems and return to this step. After making repairs on the other systems check the PAL of this system. Is there a B600 6985 reference code that was logged after the repairs you made on the other systems?

Yes: Continue with the next step.

No: Go to step 9.

8. For the B600 6985 log you found, use “Status indications for RIO/HSL” on page 21 to determine if the loop is now complete.

Is the loop complete?

- **Yes:** The problem has been resolved.

This ends the procedure.

- **No:** Go to step 9.

9. The FRU list displayed in the SAL may be different from the failing item list given here. Use the SAL's FRU list when it is available.

Does this reference code appear in the SAL with the symbolic FRU HSL_LNK listed as a FRU?

- **Yes:** Perform “RIOIP01” on page 33.

This ends the procedure.

- **No:** Exchange the FRUs listed in the SAL according to their part action codes.

This ends the procedure.

RTRIP07

Gives a link to assist you when diagnosing a keyboard error.

Perform “WSAIP01” on page 263.

RTRIP08

Gives a link to assist when the Licensed Internal Code detected an IOP programming problem.

Perform a system IPL. Is the IPL successful?

Yes: Perform “LICIP01” on page 104 to determine the cause of the problem. **This ends the procedure.**

No: Perform the action described in the new reference code. **This ends the procedure.**

SAS isolation procedures

Use the following Serial Attached SCSI (SAS) isolation procedures if an HMC is not attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

“SIP3110” on page 185

This procedure resolves problems when disk units are incompatible or a disk unit is missing or failed.

“SIP3111” on page 186

This procedure resolves the problem when two or more disk units are missing from a RAID 5 or RAID 6 disk array.

“SIP3112” on page 188

This procedure resolves the problem when one or more disk array members are not at the required physical locations.

“SIP3113” on page 189

This procedure resolves problems when a disk array is or would become exposed and parity data is out of synchronization.

“SIP3120” on page 191

This procedure resolves the problem when Cache data associated with attached disk units cannot be found.

“SIP3121” on page 192

Use this procedure to resolve the following problem: RAID adapter resources not available due to previous problems (SRC xxxx9054).

“SIP3130” on page 192

Use this procedure to resolve the following problem: Adapter does not support function expected by one or more disk units (SRC nnnn - 9008)

“SIP3131” on page 194

Use this procedure to resolve the following problem: Required cache data cannot be located for one or more disk units (SRC xxxx9050).

“SIP3132” on page 197

Use this procedure to resolve the following problem: Cache data exists for one or more missing or failed disk units (SRC xxxx9051).

“SIP3134” on page 198

Use this procedure to resolve the following problem: Disk unit requires Format before use (SRC xxxx9092)

“SIP3140” on page 200

Use this procedure to resolve the following problem: Multiple adapters connected in an invalid configuration (SRC xxxx9073)

“SIP3141” on page 201

Use this procedure to resolve the following problem: Multiple adapters not capable of similar functions or controlling same set of devices (SRC xxxx9074)

“SIP3142” on page 202

Use this procedure to resolve the following problem: Configuration error, incorrect connection between cascaded enclosures (SRC xxxx4010).

“SIP3143” on page 204

Use this procedure to resolve the following problem: Configuration error, connections exceed adapter design limits (SRC xxxx4020)

“SIP3144” on page 205

Use this procedure to resolve the following problems:

“SIP3145” on page 208

Use this procedure to resolve the following problem: Unsupported enclosure function detected (SRC nnnn - 4110).

“SIP3146” on page 209

Use this procedure to resolve the following problem: Configuration error, incomplete multipath connection between enclosures and device detected (SRC nnnn - 4041).

“SIP3147” on page 211

Use this procedure to resolve the following problem: Missing remote adapter (SRC xxxx9076)

“SIP3148” on page 212

Use this procedure to resolve the following problem: Attached enclosure does not support required multipath function (SRC xxxx4050)

“SIP3149” on page 213

Use this procedure to resolve the following problem: Incomplete multipath connection between adapter and remote adapter (SRC xxxx9075)

“SIP3150” on page 214

Use the following to perform SAS fabric problem isolation.

“SIP3152” on page 216

Use this procedure to resolve the following problems:

“SIP3153” on page 218
Go to SIP3152.

SIP3110

This procedure resolves problems when disk units are incompatible or a disk unit is missing or failed.

The following SRCs are possible:

- SRC xxxx9025 - Indicates that an incompatible disk unit is installed at the disk unit location that caused the array to be exposed.
- SRC xxxx9030 - Indicates that a disk array is exposed due to a missing or failed disk unit.
- SRC xxxx9032 - A disk unit in a disk array is missing or failed, but the array is still protected.

If you received SRC xxxx9030 or xxxx9032, one of the following occurred:

- A disk unit has failed and the RAID array protection is exposed or will become exposed if another disk unit fails because no hot spare disk unit was available to replace it. If the array is exposed, then the array will continue to be exposed until the disk unit has been replaced and a manual rebuild of the array has been started.
- A disk unit has failed in a RAID array, but a hot spare was used to automatically start a rebuild of the array. Replace, format, and configure the failed disk unit as a hot spare.

Note: If the previous hot spare disk unit was a larger capacity than the failed disk unit, ensure the customer understands that the replacement disk unit might not provide adequate hot spare coverage for all of the arrays under this adapter.

1. Is the device location information for this SRC available in the Service Action Log (see “Using the Service Action Log” on page 663 for details)?

No: Continue with the next step.

Yes: Exchange the disk unit. See “Disk Drive” on page 366. **This ends the procedure.**

2. Identify the affected adapter and disk units by examining the Product Activity Log. Perform one of the following to access System Service Tools (SST) or Dedicated Service Tools (DST):

- If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
- If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.

3. Perform the following steps:

- a. Access the Product Activity Log and display the SRC that sent you here.
- b. Press the F9 key for address information. This is the adapter address.
- c. Continue with the next step.

4. Perform the following steps:

- a. Return to the SST or DST main menu.
- b. Select **Work with disk units** → **Display disk configuration** → **Display disk configuration status**.
- c. On the Display disk configuration status display, look for the devices attached to the adapter that is identified in step 3.

Is there a device that has a status of RAID-5/Unknown”, RAID-6/Unknown”, “RAID-5/Failed”, or “RAID-6/Failed”?

No: Continue with step 7 on page 186.

Yes: Continue with the next step.

5. Find the device that has a status of RAID-5/Unknown”, RAID-6/Unknown”, “RAID-5/Failed”, or “RAID-6/Failed”. This is the device that is causing the problem. Show the device address by selecting

Display Disk Unit Details → Display Detailed Address. Record the device address. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit and find the following:

- The slot that is identified by the adapter direct select address
- The disk unit location that is identified by the device address

6. Have you determined the location of the adapter and disk unit that is causing the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Exchange the disk unit that is causing the problem. See “Disk Drive” on page 366. **This ends the procedure.**

7. Press the function key to cancel and to return to the Display Disk Configuration menu, then do the following:

- a. Select **Display disk hardware status**.
- b. Find a device that is either **Not operational** or **Read/write protected**.
- c. Display details for the device and get the location of the failed disk unit.
- d. Exchange the disk unit and configure it as a hot spare. Go to “Disk Drive” on page 366. **This ends the procedure.**

SIP3111

This procedure resolves the problem when two or more disk units are missing from a RAID 5 or RAID 6 disk array.

The following SRCs are possible:

- xxxx9020
- xxxx9021
- xxxx9022

1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following:

- a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST or DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

- c. Determine the location of the adapter and the devices that are causing the problem. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
 - The card slot that is identified by the adapter direct select address (DSA).
 - The disk unit locations that are identified by the unit addresses.
2. Perform one of the following options (listed in order of preference):

Option 1

Power off the system or partition and install the identified disk units in the correct physical locations (that is the expected addresses) in the system. **This ends the procedure.**

Option 2

Stop the disk array that contains the missing devices.

Attention: Customer data might be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST. See “Performing an IPL to DST” on page 695. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Select **Work with disk units**. Did you get to DST with a Type D IPL?
 - No:** Select **Work with disk configuration** → **Work with device parity protection**. Then, continue with substep 2c.
 - Yes:** Continue with substep 2c.
- c. Select **Stop device parity protection**.
- d. Follow the on-line instructions to stop device parity protection.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

No: Go to Chapter 1, “Starting a Service Call,” on page 1. **This ends the procedure.**

Yes: **This ends the procedure.**

Option 3

If the data on the disk units is not needed, initialize and format the remaining members of the disk array by performing the following steps:

Attention: Data on the disk unit will be lost.

If a D IPL was NOT performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units**.

- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

SIP3112

This procedure resolves the problem when one or more disk array members are not at the required physical locations.

The possible SRC is SRC xxxx9023.

1. Identify the affected adapter and disk units that are not at their required locations by examining the Product Activity Log. Perform the following:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST or DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. Record all devices that are not at their required locations. These are the array members that have a current address and an expected address which do not match. A current address of 0 is acceptable, and no action is needed to correct it for a known failed drive in the array.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. Record all devices that are not at their required locations. These are the array members that have a current address and an expected address which do not match. A current address of 0 is acceptable, and no action is needed to correct it for a known failed drive in the array.

- c. Determine the location of the adapter and the devices that are causing the problem. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
 - The card slot that is identified by the adapter direct select address (DSA).
 - The disk unit locations that are identified by the unit addresses.
2. Perform only one of the following options (listed in order of preference):

Option 1

Power off the system or partition and install the identified disk units in the correct physical locations (that is the expected addresses) in the system. **This ends the procedure.**

Option 2

Stop the disk array that contains the missing devices.

Attention: Customer data might be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST. See “Performing an IPL to DST” on page 695. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Select **Work with disk units**. Did you get to DST with a Type D IPL?

No: Select **Work with disk configuration** → **Work with device parity protection**. Then, continue with substep 2c.

Yes: Continue with the next substep 2c.

- c. Select **Stop device parity protection**.
- d. Follow the on-line instructions to stop device parity protection.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

No: Go to Chapter 1, “Starting a Service Call,” on page 1. **This ends the procedure.**

Yes: **This ends the procedure.**

Option 3

If the data on the disk units is not needed, initialize and format the remaining members of the disk array by performing the following steps:

Attention: Data on the disk unit will be lost.

If a D IPL was NOT performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

SIP3113

This procedure resolves problems when a disk array is or would become exposed and parity data is out of synchronization.

The possible SRC is xxxx9027.

1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following:
 - a. Access SST or DST.

- If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST or DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

- c. Determine the location of the adapter and the devices that are causing the problem. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
- The card slot that is identified by the adapter direct select address (DSA).
 - The disk unit locations that are identified by the unit addresses.
2. Have the adapter or disk units been physically moved recently?
- No:** Contact your hardware service provider. **This ends the procedure.**
- Yes:** Continue with the next step.
3. Perform one of the following two options (listed in order of preference):

Option 1

Power off the system or partition and restore the I/O adapter and disk units back to their original configuration. **This ends the procedure.**

Option 2

Stop the disk array that contains the missing devices.

Attention: Customer data might be lost.

Perform the following:

- If you are not already using dedicated service tools, perform an IPL to DST. See “Performing an IPL to DST” on page 695. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- Select **Work with disk units**. Did you get to DST with a Type D IPL?

No: Select **Work with disk configuration** → **Work with device parity protection**. Then, continue with substep 3c on page 191.

Yes: Continue with substep 3c.

- c. Select **Stop device parity protection**.
- d. Follow the on-line instructions to stop device parity protection.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

No: Go to Chapter 1, "Starting a Service Call," on page 1. **This ends the procedure.**

Yes: **This ends the procedure.**

Option 3

If the data on the disk units is not needed, initialize and format the disk units by performing the following steps:

Attention: Data on the disk unit will be lost.

If a D IPL was NOT performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

SIP3120

This procedure resolves the problem when Cache data associated with attached disk units cannot be found.

The possible SRC is xxxx9010

1. Has the server been powered off for several days?

No Go to step 2.

Yes Go to step 5 on page 192.

2. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:

Note: Label all parts (original and new) before moving them.

- The cache directory card from the original storage adapter. Refer to Replacing the cache directory card.
- The removable cache card from the original storage adapter. This applies only to certain adapters that have a removable cache card.

3. Has a new SRC of xxxx9010 or xxxx9050 occurred?

No Go to step 6 on page 192.

Yes Go to step 4 on page 192

4. Was the new SRC xxxx9050?

No The new SRC was xxxx9010. Reclaim adapter cache storage. See “Reclaiming IOP cache storage” on page 690.

Attention: Data might be lost. When an auxiliary cache adapter connected to the RAID adapter logs a xxxx9055 SRC in the hardware error log, the reclaim process does not result in lost sectors. Otherwise, the reclaim process does result in lost sectors.

Note: On the Reclaim Controller Cache Storage results screen, the number of lost sectors is displayed. If the number is 0, there is no data loss. If the number is not 0, data has been lost and the system operator might want to restore data after this procedure is completed.

Go to step 6.

Yes: Contact your hardware service provider. **This ends the procedure.**

5. If the server has been powered off for several days after an abnormal power-down, the cache battery pack might be depleted. Do not replace the adapter or the cache battery pack. Reclaim adapter cache storage. See “Reclaiming IOP cache storage” on page 690.

Attention: Data might be lost. When an auxiliary cache adapter connected to the RAID adapter logs a xxxx9055 SRC in the hardware error log, the reclaim process does not result in lost sectors. Otherwise, the reclaim process does result in lost sectors.

Note: On the Reclaim Controller Cache Storage results screen, the number of lost sectors is displayed. If the number is 0, there is no data loss. If the number is not 0, data has been lost and the system operator might want to restore data after this procedure is completed.

This ends the procedure.

6. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:

- The cache directory card from the new storage adapter. Refer to Replacing the cache directory card.
- The removable cache card from the new storage adapter. This only applies to certain adapters which have a removable cache card.

This ends the procedure.

SIP3121

Use this procedure to resolve the following problem: RAID adapter resources not available due to previous problems (SRC xxxx9054).

Power off the system and remove all new or replacement disk units. IPL the system to DST. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

Look for Product Activity Log entries for other reference codes and take action on them. **This ends the procedure.**

SIP3130

Use this procedure to resolve the following problem: Adapter does not support function expected by one or more disk units (SRC nnnn - 9008)

1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following:

a. Access SST/DST.

- If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.

- If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and Worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and Worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and Worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and Worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
- The card slot that is identified by the adapter direct select address (DSA).
 - The disk unit locations that are identified by the unit addresses.

Have you determined the location of the adapter and the devices that are causing the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Have the adapter or disk units been physically moved recently, or were the disk units previously used by the AIX or Linux operating system?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

3. There are two possible ways to correct the problem. Perform one of the following two options (listed in order of preference):

Option 1

Power off the system or partition and restore the adapter and disk units back to their original configuration. **This ends the procedure.**

Option 2

If the data on the disk units is not needed, initialize and format the disk units by performing the following steps:

Attention: Data on the disk unit will be lost.

If a D IPL was NOT performed to get to SST/DST:

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

SIP3131

Use this procedure to resolve the following problem: Required cache data cannot be located for one or more disk units (SRC xxxx9050).

1. Did you just exchange the adapter as the result of a failure?

No: Go to step 3.

Yes: Attention:

- a. The failed adapter that you have just exchanged contains cache data that is required by the disk units that were attached to that adapter. If the adapter that you just exchanged is failing intermittently, reinstalling it and IPLing the system might allow the data to be successfully written to the disk units. After the cache data is written to the disk units and the system is powered off normally, the adapter can be replaced without data being lost. Otherwise, continue with this procedure.
- b. Label all parts (old and new) before moving them.

Go to step 2.

2. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:
 - The cache directory card from the original storage adapter. Refer to “Replacing the cache directory card.”
 - The removable cache card from the original storage adapter. This applies only to certain adapters which have a removable cache card.

Go to step 8 on page 196.

3. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following:

- a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.

- If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. The Device Errors detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and Worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and Worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. The Device Errors detected field indicates the total number of disk units that are affected. The Device Errors logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and Worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and Worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
- The card slot that is identified by the adapter direct select address (DSA).
 - The disk unit locations that are identified by the unit addresses.

Have you determined the location of the adapter and the devices that are causing the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

4. Have the adapter card or disk units been physically moved recently?

No: Contact your hardware service provider.

Yes: Go to step 5.

5. Is the data on the disk units needed for this or any other system?

No: Go to step 7 on page 196.

Yes: Go to step 6

6. Restore the adapter and disk units back to their original configuration. The adapter and disk units must be rejoined so that the cache data can be written to the disk units.

After the cache data is written to the disk units and the system is powered off normally, the adapter or disk units may be moved to another location. **This ends the procedure**

7. Perform only one of the following options, listed in the order of preference:

Option 1

Reclaim adapter cache storage.

Attention: Data on the disk array will be lost.

See “Reclaiming IOP cache storage.” **This ends the procedure.**

Option 2

If the data on the disk units is not needed, initialize and format the disk units by performing the following steps:

Attention: Data on the disk units will be lost.

If a D IPL was NOT performed to get to SST/DST:

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures**.
- c. Select Initialize and format disk unit for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a D IPL was performed to get to DST:

- a. Access DST.
- b. Select Work with disk units.
- c. Select Initialize and format disk unit for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

8. Has a new SRC xxxx9010 or xxxx9050 occurred?

No: Go to step 10

Yes: Go to step 9

9. Was the new SRC xxxx9050?

No: The new SRC was xxxx9010.

Reclaim adapter cache storage. See “Reclaiming IOP cache storage” on page 690.

Attention: Data might be lost. When an auxiliary cache adapter connected to the RAID adapter logs an xxxx9055 SRC in the hardware error log, the reclaim process does not result in lost sectors. Otherwise, the reclaim process does result in lost sectors.

Note: On the Reclaim Controller Cache Storage results screen, the number of lost sectors is displayed. If the number is 0, there is no data loss. If the number is not 0, data has been lost and the system operator might want to restore data after this procedure is completed.

Go to step 10

Yes: Contact your hardware service provider.

10. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:

- The cache directory card from the new storage adapter. Refer to Replacing the cache directory card.
- The removable cache card from the new storage adapter. This only applies to certain adapters which have a removable cache card.

This ends the procedure.

SIP3132

Use this procedure to resolve the following problem: Cache data exists for one or more missing or failed disk units (SRC xxxx9051).

The possible causes are:

- One or more disk units have failed on the adapter.
- One or more disk units were either moved concurrently or were removed after an abnormal power off.
- The adapter was moved from a different system or a different location on this system after an abnormal power off.
- The cache of the adapter was not cleared before it was shipped to the customer.

1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following:

a. Access SST/DST.

- If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
- If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. The Device Errors detected field indicates the total number of disk units that are affected. The Device Errors logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and Worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and Worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. The Device Errors detected field indicates the total number of disk units that are affected. The Device Errors logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and Worldwide ID are provided for

up to three disk units. Additionally, the adapter type, serial number, and Worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. See Chapter 3, "Locating FRUs," on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
 - The card slot that is identified by the adapter direct select address (DSA).
 - The disk unit locations that are identified by the unit addresses.

Have you determined the location of the adapter and the devices that are causing the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Are there other disk unit or adapter errors that have occurred at approximately the same time as this error?

No: Go to step 3.

Yes: Go to step 6.

3. Is the data on the disk units (and thus the cache data for the disk units) needed for this or any other system?

No: Go to step 7.

Yes: Go to step 4

4. Have the adapter card or disk units been physically moved recently?

No: Contact your hardware service provider.

Yes: Go to step 5.

5. Restore the adapter and disk units back to their original configuration. The adapter and disk units must be rejoined so that the cache data can be written to the disk units.

After the cache data is written to the disk units and the system is powered off normally, the adapter or disk units may be moved to another location. **This ends the procedure**

6. Take action on the other errors that have occurred at the same time as this error. **This ends the procedure.**

7. Reclaim adapter cache storage. See "Reclaiming IOP cache storage" on page 690.

Attention: Data will be lost. **This ends the procedure**

SIP3134

Use this procedure to resolve the following problem: Disk unit requires Format before use (SRC xxxx9092)

The possible causes are:

- Disk unit is a previously failed disk unit from a disk array and was automatically replaced by a hot spare disk unit.
 - Disk unit is a previously failed disk unit from a disk array and was removed and later reinstalled on a different adapter or different location on this adapter.
 - Appropriate service procedures were not followed when replacing disk units or reconfiguring the adapter, such as not performing a normal power off of the system prior to reconfiguring disk units and adapters.
 - Disk unit is a member of a disk array, but was detected subsequent to the adapter being configured.
 - Disk unit has multiple or complex configuration problems.
1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following:
 - a. Access SST/DST.

- If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. The Device Errors detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and Worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and Worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. The Device Errors detected field indicates the total number of disk units that are affected. The Device Errors logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and Worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and Worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
- The card slot that is identified by the adapter direct select address (DSA).
 - The disk unit locations that are identified by the unit addresses.

Have you determined the location of the adapter and the devices that are causing the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Are there other disk unit or adapter errors that have occurred at about the same time as this error?

No: Go to step 3.

Yes: Go to step 5 on page 200.

3. Have the adapter card or disk units been physically moved recently?

No: Go to step 4.

Yes: Go to step 6 on page 200.

4. Is the data on the disk units needed for this or any other system?

No: Go to step 7.

Yes: Go to step 6.

5. Take action on the other errors that have occurred at the same time as this error. **This ends the procedure.**
6. Perform one of the following options that is most applicable to your situation:

Option 1

Perform the following to cause the adapter to rediscover the devices and connections:

- a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
- b. Vary on any other resources attached to the virtual I/O processor.

Take action on any other errors which are now occurring. **This ends the procedure.**

Option 2

Power off the system or partition and restore the adapter and disk units to their original configuration. **This ends the procedure.**

Option 3

Remove the disk units from this adapter. **This ends the procedure.**

7. Do the following to format the disk units:

Attention: All data on the disk units will be lost.

If a D IPL was NOT performed to get to SST/DST:

- a. Access SST or DST.
- b. Select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures.**
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units.**
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

SIP3140

Use this procedure to resolve the following problem: Multiple adapters connected in an invalid configuration (SRC xxxx9073)

The possible causes are:

- Incompatible adapters are connected to each other. This includes invalid adapter combinations such as the following:
 - Adapters with different write cache sizes
 - One adapter is not supported by i5/OS
 - An adapter that does not support auxiliary cache is connected to an auxiliary cache adapter
 - An adapter that supports Dual Storage IOAs is connected to another adapter which does not have the same support
 - Greater than 2 adapters are connected for Dual Storage IOAs

- Adapter code levels are not up to date or are not at the same level of functionality
- One adapter, of a connected pair of adapters, is not operating under the i5/OS operating system. Connected adapters must both be controlled by i5/OS. Additionally, both adapters must be in the same system partition.
- Adapters connected for Dual Storage IOAs are not cabled correctly. Each type of Dual Storage IOA configuration requires specific cables be used in a supported manner.

Determine which of the possible causes applies to the current configuration and take the appropriate actions to correct it. If this does not correct the error, contact your hardware service provider. **This ends the procedure.**

SIP3141

Use this procedure to resolve the following problem: Multiple adapters not capable of similar functions or controlling same set of devices (SRC xxxx9074)

1. This error relates to adapters connected in a Dual Storage IOA configuration. To obtain the reason or description for this failure, you must find the formatted error information in the Product Activity Log. This should also contain information about the connected adapter.

Perform the following:

- a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. The Problem description field indicates the type of problem. The type, serial number, and Worldwide ID of the connected adapter is also available.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. The Problem description field indicates the type of problem. The type, serial number, and Worldwide ID of the connected adapter is also available.

2. Find the problem description and information for the connected adapter (remote adapter) shown in the error log, and perform the action listed for the reason in the following table:

Table 38. RAID array reason for failure

Problem description	Full description	Action	Adapter on which to perform the action
Secondary does not support RAID level being used by primary.	Secondary adapter detected that the primary has a RAID array with a RAID level that the secondary does not support.	Customer needs to upgrade the type of secondary adapter or change the RAID level of the array on the primary to a level that is supported by the secondary.	Physically change the type of adapter that logged the error. Change RAID level on primary adapter (remote adapter indicated in the error log).
Secondary does not support disk unit function being used by primary.	Secondary adapter detected a device function that it does not support.	Customer might need to upgrade the adapter code or upgrade the type of secondary adapter.	Adapter that logged the error.
Secondary is unable to find devices found by the primary.	Secondary adapter cannot discover all the devices that the primary has.	Verify the connections to the devices from the adapter logging the error. View the disk units under each adapter using HSM to determine the SAS port with the problem.	Adapter that logged the error.
Secondary found devices not found by the primary.	Secondary adapter has discovered more devices than the primary. After this error is logged, an automatic failover will occur.	Verify the connections to the devices from the remote adapter as indicated in the error log. View the disk units under each adapter using HSM to determine the SAS port with the problem.	Remote adapter indicated in the error log.
Secondary port not connected to the same numbered port on primary.	SAS connections from the adapter to the devices are incorrect. Common disk expansion drawers must be connected to the same numbered SAS port on both adapters.	Verify connections and re-cable SAS connections as necessary.	Either adapter.
Primary lost contact with disk units accessible by secondary.	Link failure from primary adapter to devices. An automatic failover will occur.	Verify cable connections from the adapter which logged the error. Possible disk expansion drawer failure.	Adapter that logged the error.
Other	Not currently defined.	Contact your hardware service provider.	

This ends the procedure.

SIP3142

Use this procedure to resolve the following problem: Configuration error, incorrect connection between cascaded enclosures (SRC xxxx4010).

The possible causes are:

- Incorrect cabling of cascaded device enclosures.
- Use of an unsupported device enclosure.

Considerations:

- To prevent hardware damage, power off the system, partition, or card slot as appropriate, before connecting and disconnecting cables or devices.
1. Identify the affected adapter and its port by examining the Product Activity Log. Perform the following:
 - a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed, since multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labelled on the adapter tailstock.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed, since multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labelled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
 - The card slot that is identified by the adapter direct select address (DSA).
 - The physical connector identified by the port number found on the adapter tailstock.

Have you determined the location of the adapter and its port?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see “Serial attached SCSI cable planning,” in the *Site and Hardware Planning Guide*, order number SA76-0091. If unsupported device enclosures are attached, then either remove or replace them with supported device enclosures.
3. Perform the following to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.

b. Vary on any other resources attached to the virtual I/O processor.

Did the error reoccur?

No: This ends the procedure.

Yes: Contact your hardware service provider. **This ends the procedure.**

SIP3143

Use this procedure to resolve the following problem: Configuration error, connections exceed adapter design limits (SRC xxxx4020)

The possible causes are:

- Unsupported number of cascaded device enclosures.
- Improper cabling of cascaded device enclosures.

Considerations:

- To prevent hardware damage, power off the system, partition, or card slot as appropriate, before connecting and disconnecting cables or devices.
1. Identify the affected adapter and its port by examining the Product Activity Log. Perform the following:
 - a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for Address Information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed, since multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labelled on the adapter tailstock.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed, since multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labelled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:

- The card slot that is identified by the adapter direct select address (DSA).
- The physical connector identified by the port number found on the adapter tailstock.

Have you determined the location of the adapter and its port?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Reduce the number of cascaded device enclosures. Device enclosures may only be cascaded one level deep, and only in certain configurations. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see "Serial attached SCSI cable planning," in the *Site and Hardware Planning Guide*, order number SA76-0091.
3. Perform the following to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.

Did the error reoccur?

No: **This ends the procedure.**

Yes: Contact your hardware service provider. **This ends the procedure.**

SIP3144

Use this procedure to resolve the following problems:

- Configuration error, incorrect multipath connection (SRC xxxx4030)
- Configuration error, incomplete multipath connection between adapter and enclosure detected (SRC xxxx4040)

The possible causes are:

- Incorrect cabling to device enclosure.

Note: Pay special attention to the requirement that a Y0-cable, YI-cable, or X-cable must be routed along the right side of the rack frame (as viewed from the rear) when connecting to a disk expansion drawer. Review the device enclosure cabling and correct the cabling as required. To see example device configurations with SAS cabling, see "Serial attached SCSI cable planning," in the *Site and Hardware Planning Guide*, order number SA76-0091.

- A failed connection caused by a failing component in the SAS fabric between, and including, the adapter and device enclosure.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS and PCI-X/PCIe bus interface logic integrated onto the system boards and use a pluggable RAID Enablement Card (a non-PCI form factor card) for these SAS/PCI-X/PCIe buses. For these configurations, replacement of the RAID Enablement Card is unlikely to solve a SAS related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.
- Some configurations involve a SAS adapter connecting to internal SAS disk enclosures within a system using a cable card. Keep in mind that when the procedure refers to a device enclosure, it could be referring to the internal SAS disk slots or media slots. Also, when the procedure refers to a cable, it could include a cable card.

- When using SAS adapters in a Dual Storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (that is, not the secondary adapter).

Attention: When SAS fabric problems exist, replacing RAID adapters is not recommended without assistance from your service provider. Because the adapter might contain non-volatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.

1. Was the SRC xxxx4030?

No: Go to step 5 on page 207.

Yes: Go to step 2.

2. Identify the affected adapter and its port by examining the Product Activity Log. Perform the following:

a. Access SST/DST.

- If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
- If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed, since multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labelled on the adapter tailstock.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see “More information from hexadecimal reports” on page 671. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed, since multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labelled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. See Chapter 3, “Locating FRUs,” on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
- The card slot that is identified by the adapter direct select address (DSA).
 - The physical connector identified by the port number found on the adapter tailstock.

Have you determined the location of the adapter and its port?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

3. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see "Serial attached SCSI cable planning," in the *Site and Hardware Planning Guide*, order number SA76-0091.
4. Perform the following to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.

Did the error reoccur?

No: This ends the procedure.

Yes: Contact your hardware service provider. **This ends the procedure.**

5. The SRC is xxxx4040. Determine if a problem still exists for the adapter that logged this error by examining the SAS connections as follows:
 - a. On the System Service Tools (SST) screen, select **Start a Service Tool** then press Enter.
 - b. Select **Display/Alter/Dump**.
 - c. Select **Display/Alter storage**.
 - d. Select **Licensed Internal Code (LIC) data**.
 - e. Select **Advanced Analysis**.
 - f. Type in FABQUERY on the entry line and then select it with option 1.
 - g. On the Specify Advanced Analysis Options screen, type -SUB 01 -IOA DCxx -DSP 0 in the Options field, where DCxx is the adapter resource name. Press Enter.

Note: More information is available by returning to the Specify Advanced Analysis Options screen and typing -SUB 01 -IOA DCxx -DSP 2 in the Options field, where DCxx is the adapter resource name. Press Enter.

Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**

6. Perform the following to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.

Note: At this point, ignore any problems found and continue with the next step.

7. Determine if the problem still exists for the adapter that logged this error by examining the SAS connections by performing the actions in step 5 again.

Do all expected devices appear in the list and are all paths marked as Operational?

NO Go to step 8.

YES This ends the procedure.

8. Because the problem persists, some corrective action is needed to resolve the problem. Proceed by doing the following:

Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions has previously been attempted, proceed to the next one in the list.

- Reseat cables if present on adapter and device enclosure. Perform the following:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Reseat the cables.

- c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
 - Replace the cable if present from the adapter to the device enclosure. Perform the following:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Replace the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
 - Replace the internal device enclosure or refer to the service documentation for an external expansion drawer. Perform the following:
 - a. Power off the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power off the adapter slot.
 - b. Replace the device enclosure.
 - c. Power on the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power on the adapter slot.
 - Replace the adapter. The procedure to replace the adapter can be found in “PCI adapter” on page 470.
 - Contact your service provider.
9. Determine if the problem still exists for the adapter that logged this error by examining the SAS connections by performing the actions in step 5 on page 207 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Go to step 8 on page 207.

Yes: **This ends the procedure.**

SIP3145

Use this procedure to resolve the following problem: Unsupported enclosure function detected (SRC *nnnn* - 4110).

The possible causes are:

- Device enclosure or adapter code levels are not up to date.
- Unsupported type of device enclosure or device.

Considerations:

To prevent hardware damage or erroneous diagnostic results, remove power from the system as appropriate before connecting and disconnecting cables or devices.

1. Identify the affected adapter and its port by examining the Product Activity Log. Perform the following:
 - a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. The Adapter Port

field indicates the port on the adapter that is reporting the problem. There may be more than one port listed, since multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labelled on the adapter tailstock.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see "More information from hexadecimal reports" on page 671. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed, since multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labelled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. See Chapter 3, "Locating FRUs," on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
 - The card slot that is identified by the adapter direct select address (DSA).
 - The physical connector identified by the port number found on the adapter tailstock.

Have you determined the location of the adapter and its port?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Check for the latest PTFs for the device enclosure or adapter and apply them. If unsupported device enclosures or devices are attached, then either remove or replace them with supported device enclosures or devices.

Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see "Serial attached SCSI cable planning," in the *Site and Hardware Planning Guide*, order number SA76-0091.

3. Perform the following to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.

Did the error reoccur?

No: **This ends the procedure.**

Yes: Contact your hardware service provider. **This ends the procedure.**

SIP3146

Use this procedure to resolve the following problem: Configuration error, incomplete multipath connection between enclosures and device detected (SRC *nnnn* - 4041).

The possible cause is a failed connection caused by a failing component within the device enclosure, including the device itself.

Note: The adapter is not a likely cause of this problem.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.
- Some configurations involve a SAS adapter connecting to internal SAS disk enclosures within a system using a cable card. Keep in mind that when the procedure refers to a device enclosure, it could be referring to the internal SAS disk slots or media slots. Also, when the procedure refers to a cable, it could include a cable card.
- When using SAS adapters in a Dual Storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (that is, not the secondary adapter).

Attention: Removing functioning disk units in a disk array is not recommended without assistance from your service provider. If functioning disk units are removed, a disk array might become unprotected or failed and additional problems could be created.

1. Determine the resource name of the adapter that reported the problem by performing the following:
 - a. Access SST/DST.
 - b. Access the Product Activity Log and record the resource name that this error is logged against. If the resource name is an adapter resource name, use it and continue with the next step. If the resource name is a disk unit resource name, use Hardware Service Manager to determine the resource name of the adapter that is controlling this disk unit.
2. Determine if a problem still exists for the adapter that logged this error by examining the SAS connections as follows:
 - a. On the System Service Tools (SST) display, select **Start a Service Tool** then press Enter.
 - b. Select **Display/Alter/Dump**.
 - c. Select **Display/Alter storage**.
 - d. Select **Licensed Internal Code (LIC) data**.
 - e. Select **Advanced Analysis**.
 - f. Type in FABQUERY on the entry line and then select it with option 1.
 - g. On the Specify Advanced Analysis Options screen, type -SUB 01 -IOA DCxx -DSP 0 in the Options field, where DCxx is the adapter resource name. Press Enter.

Note: More information is available by returning to the Specify Advanced Analysis Options screen and typing -SUB 01 -IOA DCxx -DSP 2 in the Options field, where DCxx is the adapter resource name. Press Enter.

Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**

3. Perform the following to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.
4. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**

5. Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions has previously been attempted, proceed to the next one in the list.

- Review the device enclosure cabling and correct the cabling as required. To see example device configurations with SAS cabling, see Serial attached SCSI cable planning, in the *Site and Hardware Planning Guide*, order number SA76-0091.
 - Reseat the cables if present on the adapter and the device enclosure. Perform the following:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Reseat the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
 - Replace the cable if present from the adapter to the device enclosure. Perform the following:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Replace the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
 - Replace the internal device enclosure or refer to the service documentation for an external expansion drawer. Perform the following:
 - a. Power off the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power off the adapter slot.
 - b. Replace the device enclosure.
 - c. Power on the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power on the adapter slot.
 - Replace the adapter. The procedure to replace the adapter can be found in “PCI adapter” on page 470.
 - Contact your service provider.
6. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 on page 210 again. Do all expected devices appear in the list and are all paths marked as Operational?
- No:** Go to step 5 on page 210.
- Yes:** The error condition no longer exists. **This ends the procedure..**

SIP3147

Use this procedure to resolve the following problem: Missing remote adapter (SRC xxxx9076)

1. An adapter attached in either an Auxiliary Cache or Dual Storage IOA configuration was not discovered in the allotted time. To obtain additional information about the configuration involved, locate the formatted log in the Product Activity Log.
 - a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for “Address Information”. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information” to record the formatted log information. The “Type of adapter connection” field indicates the type of configuration involved.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see "More information from hexadecimal reports" on page 671. The "Type of adapter connection" field indicates the type of configuration involved.

2. Determine which of the following is the cause of your specific error and take the appropriate actions listed. If this does not correct the error, contact your hardware service provider. The possible causes are:
 - An attached adapter for the configuration is not installed or is not powered on. Some adapters are required to be part of a Dual Storage IOA Configuration. Ensure that both adapters are properly installed and powered on.
 - If this is an Auxiliary Cache or Dual Storage IOA configuration, then both adapters may not be in the same partition. Ensure that both adapters are assigned to the same partition.
 - An attached adapter does not support the desired configuration.
 - An attached adapter for the configuration is failed. Take action on the other errors that have occurred at the same time as this error.
 - Adapter code levels are not up to date or are not at the same level of functionality. Ensure that the code for both adapters is at the latest level.

Note: The adapter that is logging this error will run in a performance degraded mode, without caching, until the problem is resolved.

This ends the procedure.

SIP3148

Use this procedure to resolve the following problem: Attached enclosure does not support required multipath function (SRC xxxx4050)

The possible cause is the use of an unsupported device enclosure.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
1. Identify the adapter and adapter port associated with the problem by examining the Product Activity Log. Perform the following:
 - a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See "System Service Tools (SST)" on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See "Performing an IPL to DST" on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the Product Activity Log and record address information.

If a D IPL was NOT performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for "Address Information". This is the adapter address.

Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the "Additional Information" to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed, since multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labelled on the adapter tailstock.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-Cc-bb:

BBBB hexadecimal offsets 4C and 4D

Cc hexadecimal offset 51

bb hexadecimal offset 4F

In order to interpret the hexadecimal information to get device addresses, see "More information from hexadecimal reports" on page 671. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed, since multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labelled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. See Chapter 3, "Locating FRUs," on page 347 and find the diagram of the system unit, or the expansion unit. Then find the following:
 - The card slot that is identified by the adapter direct select address (DSA).
 - The physical connector identified by the port number found on the adapter tailstock.

Have you determined the location of the adapter and its port?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. If unsupported device enclosures are attached to the identified adapter port, then either remove or replace them with supported device enclosures.
3. Perform the following to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.

Did the error reoccur?

No: **This ends the procedure.**

Yes: Contact your hardware service provider. **This ends the procedure.**

SIP3149

Use this procedure to resolve the following problem: Incomplete multipath connection between adapter and remote adapter (SRC xxxx9075)

The possible cause is incorrect cabling between SAS RAID adapters.

Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.

Review the device enclosure cabling and correct the cabling as required. To see example device configurations with SAS cabling, see "Serial attached SCSI cable planning," in the *Site and Hardware Planning Guide*, order number SA76-0091.

This ends the procedure.

SIP3150

Use the following to perform SAS fabric problem isolation.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS and PCI-X/PCIe bus interface logic integrated onto the system boards and use a pluggable RAID Enablement Card (a non-PCI form factor card) for these SAS/PCI-X/PCIe buses. For these configurations, replacement of the RAID Enablement Card is unlikely to solve a SAS related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.

Attention: When SAS fabric problems exist, obtain assistance from your hardware service provider:

- Before you replace a RAID adapter. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Before you remove functioning disk units in a disk array. A disk array might become unprotected or failed and additional problems might be created if functioning disk units are removed from a disk array.

1. Was the SRC xxxx3020?

No Go to step 3.

Yes Go to step 2.

2. The possible causes are:

- More devices are connected to the adapter than the adapter supports. Change the configuration to reduce the number of devices below what is supported by the adapter.
- A SAS device has been incorrectly moved from one location to another. Either return the device to its original location or move the device while the adapter is powered off.
- A SAS device has been incorrectly replaced by a SATA device. A SAS device must be used to replace a SAS device.

This ends the procedure.

3. Determine the status of the disk units in the array by doing the following:

- a. Access the Product Activity Log and display the SRC that sent you here.
- b. Press the F9 key for address information. This is the adapter address.
- c. Return to the SST or DST main menu.
- d. Select **Work with disk units** → **Display disk configuration** → **Display disk configuration status**.
- e. On the Display disk configuration status screen, look for the devices attached to the adapter that was identified.

Is there a device that has a status of "RAID-5/Unknown", "RAID-6/Unknown", "RAID-5/Failed", or "RAID-6/Failed"?

No Go to step 5.

Yes Go to step 4

4. Other errors should have occurred related to the disk array having degraded protection. Take action on these errors to replace the failed disk unit and restore the disk array to a fully protected state.

This ends the procedure.

5. Have other errors occurred at the same time as this error?

- No** Go to step 7.
- Yes** Go to step 6
6. Take action on the other errors that have occurred at the same time as this error. **This ends the procedure.**
 7. Was the SRC xxxxFFFE?

No Go to step 10.

Yes Go to step 8.
 8. Check for the latest PTFs for the device, device enclosure, and adapter and apply them. Did you find and apply a PTF?

No Go to step 10.

Yes Go to step 9.
 9. **This ends the procedure.**
 10. Identify the adapter and adapter port associated with the problem by examining the Product Activity Log. Perform the following:
 - a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See “System Service Tools (SST)” on page 665.
 - If you cannot enter a command at the console, perform an IPL to DST. See “Performing an IPL to DST” on page 695.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the Product Activity Log and display the SRC that sent you here. Record the adapter address and the adapter port by doing one of the following:
 - If the SRC is xxxxFFFE, press the F9 key for “Address Information”. The adapter address is the bus, board, card information. The port is shown in the “I/O bus” field. Convert the port value from decimal to hexadecimal.
 - Press the F9 key for “Address Information”. The adapter address is the bus, board, card information. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the “Additional Information”, if available. The adapter port is characters 1 and 2 of the unit address. For example, if the unit address is 123456FF, the port would be 12.
 - Go to “Hexadecimal Product Activity Log data” on page 687 to obtain the address information. The adapter address is the bus, board, card information. The adapter port is characters 1 and 2 of the unit address. For example, if the unit address is 123456FF, the port would be 12.
 11. Use the adapter address to find the location of the adapter (see Chapter 3, “Locating FRUs,” on page 347). On the tailstock of the adapter, find the port identified in the previous step. This is the port that is used to attach the device, or device enclosure, that is experiencing the problem.
 12. Because the problem persists, some corrective action is needed to resolve the problem. Proceed by doing the following:

Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions has previously been attempted, proceed to the next one in the list.

 - Reseat cables if present on adapter and device enclosure. Perform the following:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Reseat the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
 - Replace the cable if present from the adapter to the device enclosure. Perform the following:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.

- b. Replace the cables.
- c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the device. See “Disk Drive” on page 366.

Note: If there are multiple devices with a path which is not Operational, then the problem is not likely to be with a device.

- Replace the internal device enclosure or refer to the service documentation for an external expansion drawer. Perform the following:
 - a. Power off the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power off the adapter slot.
 - b. Replace the device enclosure.
 - c. Power on the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power on the adapter slot.
- Replace the adapter. The procedure to replace the adapter can be found in “PCI adapter” on page 470.
- Contact your service provider.

13. Does the problem still occur after performing the corrective action?

No: This ends the procedure.

Yes: Go to step 12 on page 215.

SIP3152

Use this procedure to resolve the following problems:

- Multipath redundancy level got worse (SRC xxxx4060)
- Device bus fabric error (SRC xxxx4100)
- Temporary device bus fabric error (SRC xxxx4101)

The possible causes are:

- A failed connection caused by a failing component in the SAS fabric between, and including, the adapter and device enclosure.
- A failed connection caused by a failing component within the device enclosure, including the device itself.

Note: For SRC xxxx4060, the failed connection was previously working, and may have already recovered.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS and PCI-X/PCIe bus interface logic integrated onto the system boards and use a pluggable RAID Enablement Card (a non-PCI form factor card) for these SAS/PCI-X/PCIe buses. For these configurations, replacement of the RAID Enablement Card is unlikely to solve a SAS related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.
- Some configurations involve a SAS adapter connecting to internal SAS disk enclosures within a system using a cable card. Keep in mind that when the procedure refers to a device enclosure, it could be referring to the internal SAS disk slots or media slots. Also, when the procedure refers to a cable, it could include a cable card.

- When using SAS adapters in a Dual Storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (not the secondary adapter).

Attention:

1. When SAS fabric problems exist, replacing RAID adapters is not recommended without assistance from your service provider. Because the adapter might contain non-volatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
2. Removing functioning disk units in a disk array is not recommended without assistance from your service provider. A disk array might become unprotected or failed if functioning disk units are removed. The removal of functioning disk units might also result in additional problems in the disk array.
1. Determine the resource name of the adapter that reported the problem by performing the following:
 - a. Access SST/DST.
 - b. Access the Product Activity Log and record the resource name that this error is logged against. If the resource name is an adapter resource name, use it and continue with the next step. If the resource name is a disk unit resource name, use the Hardware Service Manager to determine the resource name of the adapter that is controlling this disk unit.
2. Determine if a problem still exists for the adapter that logged this error by examining the SAS connections as follows:
 - a. On the System Service Tools (SST) screen, select **Start a Service Tool** then press Enter.
 - b. Select **Display/Alter/Dump**.
 - c. Select **Display/Alter storage**.
 - d. Select **Licensed Internal Code (LIC) data**.
 - e. Select **Advanced Analysis**.
 - f. Type in FABQUERY on the entry line and then select it with option 1.
 - g. On the Specify Advanced Analysis Options screen, type -SUB 01 -IOA DCxx -DSP 0 in the Options field, where DCxx is the adapter resource name. Press Enter.

Note: More information is available by returning to the Specify Advanced Analysis Options screen and typing -SUB 01 -IOA DCxx -DSP 2 in the Options field, where DCxx is the adapter resource name. Press Enter.

Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**

3. Perform the following to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.
4. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**
5. Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions has previously been attempted, then proceed to the next one in the list.
 - Reseat cables if present on adapter and device enclosure. Perform the following:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Reseat the cables.

- c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the cable if present from adapter to device enclosure. Perform the following:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Replace the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the device. See “Disk Drive” on page 366.

Note: If there are multiple devices with a path that is not Operational, then the problem is not likely to be with a device.

- Replace the internal device enclosure or refer to the service documentation for an external expansion drawer. Perform the following:
 - a. Power off the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power off the adapter slot.
 - b. Replace the device enclosure.
 - c. Power on the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power on the adapter slot.
 - Replace the adapter. The procedure to replace the adapter can be found in “PCI adapter” on page 470.
 - Contact your service provider.
6. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 on page 217 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Go to step 5 on page 217.

Yes: The error condition no longer exists. **This ends the procedure..**

SIP3153

Go to SIP3152.

Service processor isolation procedures

Use service processor isolation procedures if there is no HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

“FSPSP01” on page 222

A part vital to system function has been deconfigured.

“FSPSP02” on page 223

This procedure is for boot failures that terminate very early in the boot process.

“FSPSP03” on page 223

A system operator or user error has occurred.

“FSPSP04” on page 223

A problem has been detected in the service processor firmware.

“FSPSP05” on page 224

The service processor has detected a problem in the platform firmware.

“FSPSP06” on page 224

The service processor reported a suspected intermittent problem.

“FSPSP07” on page 224

The time of day has been reset to the default value.

“FSPSP09” on page 224

A problem has been detected with a memory DIMM, but it cannot be isolated to a specific memory DIMM.

“FSPSP10” on page 224

The part indicated in the FRU list that follows this procedure is invalid or missing for this system's configuration.

“FSPSP11” on page 225

The service processor has detected an error on the RIO/HSL port in the system unit.

“FSPSP12” on page 225

The DIMM FRU that was previously replaced did not correct the memory error.

“FSPSP14” on page 225

The service processor cannot communicate with the system firmware. The server firmware will continue to run the system and partitions while it attempts to recover communications. Server firmware recovery actions will continue for approximately 30 to 40 minutes.

“FSPSP16” on page 225

Save any error log and dump data and contact your next level of support for assistance.

“FSPSP17” on page 225

A system uncorrectable error has occurred.

“FSPSP18” on page 226

A problem has been detected in the platform LIC.

“FSPSP20” on page 226

A failing item has been detected by a hardware procedure.

“FSPSP22” on page 226

The system has detected that a processor chip is missing from the system configuration because JTAG lines are not working.

“FSPSP23” on page 226

The system needs to perform a service processor dump.

“FSPSP24” on page 227

The system is running degraded. Array bit steering may be able to correct this problem without replacing hardware.

“FSPSP25” on page 227

The server has detected an over temperature thermal fault.

“FSPSP27” on page 227

An attention line has been detected as having a problem. If the FRU replaced before this procedure did not correct the problem, perform the following:

“FSPSP28” on page 228

The resource ID (RID) of the FRU could not be found in the vital product data (VPD) table.

“FSPSP29” on page 228

The system has detected that all I/O bridges are missing from the system configuration.

“FSPSP30” on page 229

A problem has been encountered accessing the VPD card or the data found on the VPD card has been corrupted.

“FSPSP31” on page 229

The service processor has detected that one or more of the required fields in the system VPD has not been initialized.

“FSPSP32” on page 229

A problem with the enclosure has been found.

“FSPSP33” on page 230

A problem has been detected in the connection with the HMC.

“FSPSP34” on page 231

The memory cards are plugged in an invalid configuration and cannot be used by the system.

“FSPSP35” on page 231

The system has detected a problem with a memory controller.

“FSPSP36” on page 231

One or both of the SMP cables connecting the system processor cards on this system are incorrectly plugged, broken, or not the correct type of cable for this system configuration.

“FSPSP38” on page 232

The system has detected an error within the JTAG path. If the FRU replaced before this procedure did not correct the problem, perform the following:

“FSPSP42” on page 233

An error communicating between two system processors was detected.

“FSPSP45” on page 233

The system has detected an error with FSI path.

“FSPSP46” on page 234

Some corrupt areas of flash or RAM have been detected on the service processor.

“FSPSP47” on page 234

The system has detected an error within the PSI link. To resolve the problem, perform the following:

“FSPSP48” on page 234

A diagnostic function detects an external processor interface problem. If replacing the FRUs previously listed in the FRU list do not fix the problem, perform the following:

“FSPSP49” on page 234

A diagnostic function detects an internal processor interface problem. If replacing the FRUs previously listed in the FRU list do not fix the problem, perform the following:

“FSPSP50” on page 234

A diagnostic function detects a connection problem between a processor chip and a GX chip. If replacing the FRUs previously listed in the FRU list do not fix the problem, perform the following:

“FSPSP51” on page 235

Runtime diagnostics detected a memory bus correctable error that is exceeding the threshold. The memory bus correctable error will not cause an immediate loss of system operations. However, the system is operating in a degraded mode. To resolve the problem, perform the following:

“FSPSP52” on page 235

A problem has been detected on a memory bus. If the FRUs replaced before this procedure did not resolve the problem, perform the following:

“FSPSP54” on page 235

A processor over-temperature has been detected. Check for any environmental issues before replacing any parts.

“FSPSP55” on page 235

An error has been detected on a bus between two FRUs. The endpoint FRUs have been called out, however, the source of the error could be the bus path between the FRUs.

“FSPSP63” on page 237

The system has experienced a power error. Please review previous error logs for power-related issues.

“FSPSP64” on page 237

All the processor support interface (PSI) links of the system are either nonfunctional or deconfigured, so the system cannot perform an IPL appropriately. Look for previous error logs that deconfigure hardware.

“FSPSPC1” on page 237

If the system hangs after the code that sent you to this procedure appears in the control panel, perform these steps to reset the service processor.

“FSPSPD1” on page 238

If the system hangs after the code that sent you to this procedure appears in the control panel, perform these steps to reset the service processor.

FSPSP01

A part vital to system function has been deconfigured.

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

Perform the following steps:

1. Is the SRC B1xxB10C or B1xxB10D (xx means don't care what Subsystem ID)?

No: Go to step 5.

Yes: The system has detected a deconfigured memory controller that is required for the system to function, or it has detected that there is not enough memory or that the memory is plugged incorrectly. Continue with the next step.

2. Perform the following steps:

- a. Reseat all of the memory DIMMs in each processor enclosure (primary and all secondary units) but do not replace any memory DIMMs at this time.
- b. Perform a slow boot. Refer to “Performing a slow boot” on page 722.

Does the problem persist?

Yes: Continue with the next step.

No: Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

3. Use the following procedure to replace each memory DIMM, one at a time, and perform a slow boot after each replacement until the problem is resolved.

- a. Replace the first memory DIMM in the first processor enclosure.
- b. Perform a slow boot, refer to “Performing a slow boot” on page 722.
- c. Does the problem persist?

Yes: Repeat this step and replace the next memory DIMM. If you have replaced all of the memory DIMMs, then continue with the next step.

No: Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

4. Use the following procedure to replace each processor card, one at a time, and perform a slow boot after each replacement until the problem is resolved.

- a. Replace the first processor card in the primary processor enclosure.
- b. Perform a slow boot, refer to “Performing a slow boot” on page 722.
- c. Does the problem persist?

Yes: Repeat this step and replace the second processor card in the primary enclosure. If necessary continue repeating this step in each secondary processor enclosure until the problem is resolved. If you have replaced all of the processor cards, contact your next level of support.

No: Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

5. Is the SRC B1xxB107 or B1xxB108?

- **No:** Continue with the next step.
- **Yes:** The system has detected a problem with a clock module on one of the service processors. Starting in the primary processor enclosure and continuing in the secondary enclosures, replace the system processor cards one at a time (starting with P2-C1 then P2-C2) until the problem is resolved. Perform a slow boot after replacing each processor card. Refer to “Performing a slow boot” on page 722. **This ends the procedure.**

6. Is the SRC B1xxB106?

- **No:** Continue with the next step.

- **Yes:** The system has detected that all the system backplanes are deconfigured. Perform the following:
 - a. Review the system error logs for errors that called out system backplanes. This will indicate which system backplanes have problems and need to be replaced.
 - b. Replace the system backplane in the enclosure indicated by the logs.
 - c. Perform a slow boot, refer to “Performing a slow boot” on page 722.
 - d. Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**
7. Is the SRC B1xxB110 or B1xxB111?
- **No:** Contact your next level of support. **This ends the procedure.**
 - **Yes:** The system has detected that all of the I/O bridges are deconfigured. Perform the following:
 - a. Review the system error logs for errors that called out I/O backplanes. This will indicate which I/O backplanes have problems and need to be replaced.
 - b. Replace the I/O backplane in the enclosure indicated by the logs
 - c. Perform a slow boot, refer to “Performing a slow boot” on page 722.
 - d. Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

FSPSP02

This procedure is for boot failures that terminate very early in the boot process.

This error path is indicated when the SRC data words are scrolling automatically through control panel functions 11, 12, and 13, and the control panel interface buttons are not responsive.

Perform the following:

1. Push the white power button to reset the system and bring it up on the other side of platform LIC.

Note: The white power button will only reset the system and attempt to reach standby.
2. Did an SRC occur after bringing the system up on the other side?

No: Refer to the system operations guide and verify that the system’s firmware is at the latest level. Update the system’s firmware on the failing side if necessary. **This ends the procedure.**

Yes: Continue with the next step.
3. Is the SRC the same SRC that brought you to this procedure?
 - **No:** Perform problem analysis to service this new SRC. **This ends the procedure.**
 - **Yes:** Perform the following:
 - a. Replace the service processor.
 - b. If the problem persists, replace the system backplane.

This ends the procedure.

FSPSP03

A system operator or user error has occurred.

Refer to the documentation for the task that you were attempting to perform.

FSPSP04

A problem has been detected in the service processor firmware.

Refer to *Operations Guide for ASMI and for Nonpartitioned Systems* (SA76-0094) or *Operations Guide for the Hardware Management Console and Managed Systems* (SA76-0085) and verify that the system’s firmware is at the latest level. Update the system’s firmware if necessary.

FSPSP05

The service processor has detected a problem in the platform firmware.

Refer to the *Operations Guide for ASMI and for Nonpartitioned Systems*, SA76-0094 **OR** the *Operations Guide for the Hardware Management Console and its Managed Systems*, SA76-0085 and verify that the system's firmware is at the latest level. Update the system's firmware if necessary.

FSPSP06

The service processor reported a suspected intermittent problem.

Contact your next level of support.

FSPSP07

The time of day has been reset to the default value.

1. To set the time of day, refer to the systems operations guide.
2. If the problem persists, replace the TOD battery.
3. After replacing the battery, perform a slow boot. **This ends the procedure.**

FSPSP09

A problem has been detected with a memory DIMM, but it cannot be isolated to a specific memory DIMM.

1. Using the FRU called out after this procedure, replace **ALL** the memory DIMMs that reside on the same memory board/card. See Chapter 3, "Locating FRUs," on page 347 for instructions.
2. Perform a slow boot after replacing all the memory DIMMs. **This ends the procedure.**

FSPSP10

The part indicated in the FRU list that follows this procedure is invalid or missing for this system's configuration.

Refer to Chapter 3, "Locating FRUs," on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

Perform the following to correct the problem:

1. Does word 8 (the 8 leftmost characters in the 2nd line of function 13) of the reference code end with 02 or 04?

No: Go to step 3.

Yes: Continue with the next step.

2. The FRU that is called out after this procedure is either missing or invalid. Is that FRU installed and connected or plugged in properly?

Yes: The installed FRU is invalid. Remove that FRU. Then contact your next level of support to determine the correct FRU. **This ends the procedure.**

No: The FRU is missing. If the FRU is present but not connected, reconnect it and perform a slow boot (see "Performing a slow boot" on page 722). Otherwise, contact your next level of support to determine the missing FRU. **This ends the procedure.**

3. Does word 8 end with 01 or 05?

No: Perform problem analysis with this code. **This ends the procedure.**

Yes: The FRU that is listed after this procedure has the same serial number as another FRU in the system. Remove all but one of the FRUs that are listed after this procedure and then perform a slow boot (see "Performing a slow boot" on page 722). **This ends the procedure.**

FSPSP11

The service processor has detected an error on the RIO/HSL port in the system unit.

1. Refer to the system operations guide and verify that the system's firmware is at the latest level. Update the system's firmware if necessary.
2. If the problem persists, replace each I/O backplane one at a time. Perform a slow boot between each replacement until the problem is resolved. Refer to "Performing a slow boot" on page 722 **This ends the procedure.**

FSPSP12

The DIMM FRU that was previously replaced did not correct the memory error.

Perform the following:

1. Power off the system (see "Powering on and powering off" on page 641).
2. Replace the board DIMM is plugged into. See Chapter 3, "Locating FRUs," on page 347 for instructions.
3. Perform a slow boot.

This ends the procedure.

FSPSP14

The service processor cannot communicate with the system firmware. The server firmware will continue to run the system and partitions while it attempts to recover communications. Server firmware recovery actions will continue for approximately 30 to 40 minutes.

Perform the following:

1. Record the time the log was created or when the SRC was first noticed. Continue with the next step.
2. Are progress codes being displayed on the panel?
 - **Yes:** Server firmware was able to reset the service processor. **This ends the procedure.**
 - **No:** Continue with the next step.
3. Has an A7006995 SRC been displayed on the panel?
 - **Yes:** Partitions are being powered off and a server dump will be attempted. Follow the A7006995 SRC description if the partitions do not terminate as requested. **This ends the procedure.**
 - **No:** Continue with the next step.
4. Has the A1xx SRC remained on the panel for more than 40 minutes?
 - **Yes:** Server firmware could not begin termination of the partitions. Contact your next level of support to assist in attempting to terminate any remaining partitions and forcing a server dump. Collect the dump for support, power off and power on the system. **This ends the procedure.**
 - **No:** Contact your next level of support. **This ends the procedure.**

FSPSP16

Save any error log and dump data and contact your next level of support for assistance.

FSPSP17

A system uncorrectable error has occurred.

1. Look for other serviceable events and use the callouts listed with them to correct the problem.
2. You can run the system in a degraded mode until you can perform the service actions. To run the system in a degraded mode, do the following:
 - a. Power off the system (see "Powering on and powering off" on page 641).

- b. Power on the system (see “Powering on and powering off” on page 641) to allow the memory diagnostics to release the memory. Change out any defective parts.

This ends the procedure.

FSPSP18

A problem has been detected in the platform LIC.

Refer to the *Operations Guide for the Hardware Management Console and Managed Systems*, SA76-0085, or the *Operations Guide for ASMI and for Nonpartitioned Systems*, SA76-0094, and verify that the server firmware is at the latest level. Update the server firmware if necessary.

FSPSP20

A failing item has been detected by a hardware procedure.

Perform a slow boot to run full hardware diagnostics.

If a new SRC occurs, repair the system using that reference code.

If an incomplete occurs, go to “Accessing the ASMI” on page 702 menus to power off, check for deconfigured components and perform a slow boot.

This ends the procedure.

FSPSP22

The system has detected that a processor chip is missing from the system configuration because JTAG lines are not working.

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

1. Power off the system.
2. Replace the service processor.
3. Perform a slow boot..
4. Does the problem persist?

Yes: Continue with the next step.

No: This ends the procedure.

5. Perform the following for each system processor until the problem is resolved:
 - a. Power off the system.
 - b. Replace one of the system processors.
 - c. Perform a slow boot after replacing each processor.

This ends the procedure.

FSPSP23

The system needs to perform a service processor dump.

1. Perform a service processor dump (see “Performing a platform system or service processor dump” on page 710).
2. Attempt to perform an IPL on the system.
3. Save the service processor dump to storage (see “Managing dumps” on page 710).
4. Contact your next level of support. **This ends the procedure.**

FSPSP24

The system is running degraded. Array bit steering may be able to correct this problem without replacing hardware.

1. Power off the system (see “Powering on and powering off” on page 641).
2. Go to “Performing a slow boot” on page 722. **This ends the procedure.**
3. If the problem persists, replace the FRU that is called out after this procedure. See Chapter 3, “Locating FRUs,” on page 347 for instructions. **This ends the procedure.**

FSPSP25

The server has detected an over temperature thermal fault.

1. Before replacing any server hardware FRU callouts, look in the error log for thermal problems related to fans, power supplies, etc. Perform all service actions for the thermal problem SRCs first before continuing with any other callouts in the current SRC. Thermal problems are associated with 1100 xxxx SRCs, where xxxx may be any of the following:
 - 1514
 - 1524
 - 7201
 - 7203
 - 7205
 - 7610
 - 7611
 - 7620
 - 7621
 - 7630
 - 7631
 - 7640
 - 7641
2. If no thermal related SRCs or problems can be found, replace the server hardware FRU called out in the current SRC. See Chapter 3, “Locating FRUs,” on page 347 for instructions. **This ends the procedure.**

FSPSP27

An attention line has been detected as having a problem. If the FRU replaced before this procedure did not correct the problem, perform the following:

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions on replacing any FRUs called out by this procedure.

1. Was the FRU called out before this procedure a Memory DIMM (Un-P2-C1-Cx or Un-P2-C2-Cx)?
 - No:** Go to step 10 on page 228
 - Yes:** A Memory DIMM attention line has an error. Continue to the next step.
2. Replace the Service Processor (Un-P1-C11) from the same drawer as the Memory DIMM.
3. Perform a slow boot.
4. Does the problem persist?
 - No: This ends the procedure.**
 - Yes:** Continue to the next step.
5. Replace the processor card (Un-P2-C1 or Un-P2-C2) on which you previously replaced DIMMs.
6. Perform a slow boot.

7. Does the problem persist?
No: This ends the procedure.
Yes: Continue with the next step.
8. Replace the System Backplane (Un-P1) from the same drawer as the Memory DIMM.
9. Perform a slow boot. **This ends the procedure.**
10. Was the FRU called out before this procedure a Processor Card (Un-P2-C1 or Un-P2-C2) or GX Adapter Card (Un-P1-C8 or Un-P1-C9)?
No: Go to step 16
Yes: A Processor Card or GX Adapter Card attention line has an error. Continue to the next step.
11. Replace the Service Processor (Un-P1-C11) from the same drawer as the Processor Card or GX Adapter Card.
12. Perform a slow boot.
13. Does the problem persist?
No: This ends the procedure.
Yes: Continue with the next step.
14. Replace the System Backplane (Un-P1) from the same drawer as the Processor Card or GX Adapter Card.
15. Perform a slow boot. **This ends the procedure.**
16. Was the FRU called out before this the System Backplane (Un-P1)?
No: Contact your next level of support. **This ends the procedure.**
Yes: A P5IOC2 attention line has an error. Continue to the next step.
17. Replace the Service Processor (Un-P1-C11) from the same drawer as the System Backplane.
18. Perform a slow boot. **This ends the procedure.**

FSPSP28

The resource ID (RID) of the FRU could not be found in the vital product data (VPD) table.

1. Find another callout that reads "FSPxxxx" where xxxx is a 4 digit hex number that represents the RID. Record the RID and the model of the system.
2. Call next level of support to find out which FRU the RID represents.
3. Replace the FRU that the RID represents.
4. Perform a slow boot to ensure full hardware diagnostics. **This ends the procedure.**

FSPSP29

The system has detected that all I/O bridges are missing from the system configuration.

Refer to Chapter 3, "Locating FRUs," on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

1. Power off the system (see "Powering on and powering off" on page 641).
2. Replace the Service Processor (Un-P1-C11).
3. Perform a slow boot.
4. Does the problem persist?
Yes: Continue with the next step.
No: Go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**
5. Replace the system backplane (Un-P1).
6. Perform a slow boot.
7. Does the problem persist?
Yes: Continue with the next step.

No: Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

8. Replace each Secondary Unit System Backplane (Un-P1), one at a time, until the problem is resolved.
This ends the procedure.

FSPSP30

A problem has been encountered accessing the VPD card or the data found on the VPD card has been corrupted.

This error occurred before VPD collection was completed. No location codes have been created.

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

1. Power off the system and remove ac power.
2. Clear any deconfiguration errors for the VPD card.
3. Replace all the service processors.
4. Perform a slow boot. Does the problem persist?

Yes: Continue with the next step.

No: Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

5. Replace the VPD card.
6. Perform a slow boot. Does the problem persist?
 - **Yes:** Continue with the next step.
 - **No:** Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**
7. Power off the system.
8. Replace the system backplane. **This ends the procedure.**

FSPSP31

The service processor has detected that one or more of the required fields in the system VPD has not been initialized.

1. Log into ASMI with authorized service provider authority (see “Accessing the ASMI” on page 702).
2. Set the system VPD values.

Note: The service processor will automatically reset when leaving the ASMI after updating the system VPD.

3. Power on the system (“Powering on and powering off” on page 641). **This ends the procedure.**

FSPSP32

A problem with the enclosure has been found.

The problem is resulting from one of the following:

- the enclosure VPD cannot be found,
- the enclosure serial number is not programmed, or
- the enclosure feature code is not programmed.

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

Perform the following:

1. Record the reason code (the last 4 characters of word 11) from the SRC by looking at the operator panel or accessing the error log with the ASMI.

2. Is the reason code A46F?
No: Go to step 6.
Yes: Continue with the next step.
3. Check for and apply any server firmware updates. Does the problem persist?
No: This ends the procedure.
Yes: Continue with the next step.
4. Perform the following:
 - a. Replace the service processor.
 - b. Perform a slow boot.Does the problem persist?
No: This ends the procedure.
Yes: Continue with the next step.
5. Perform the following:
 - a. Replace the system backplane.
 - b. Perform a slow boot.Does the problem persist?
No: This ends the procedure.
Yes: Continue with the next step.
6. Is the reason code A460?
No: Go to step 8.
Yes: Continue with the next step.
7. Perform the following:
 - a. Set the enclosure serial number using the ASMI (see “Setting the system identifiers” on page 707).
 - b. The service processor will automatically reset when leaving the ASMI after updating the serial number.
 - c. Perform a slow boot.Does the problem persist?
No: This ends the procedure.
Yes: Contact your next level of support. **This ends the procedure.**
8. Is the reason code A45F?
No: Contact your next level of support. **This ends the procedure.**
Yes: Continue with the next step.
9. Perform the following:
 - a. Set the enclosure feature code using the ASMI (see “Setting the system enclosure type” on page 706).
 - b. The service processor will automatically reset when leaving the ASMI after updating the serial number.
 - c. Perform a slow boot.Does the problem persist?
No: This ends the procedure.
Yes: Contact your next level of support. **This ends the procedure.**

FSPSP33

A problem has been detected in the connection with the HMC.

1. Ensure that the cable connectors to the network from the HMC, managed system, managed system partitions, and other HMCs are securely connected. If the connections are not secure, plug the cables back into the proper locations and make sure that the connections are good.

2. Check to see if the HMC is working correctly or if the HMC was disconnected incorrectly from the managed system, managed system partitions, and other HMCs. If either has happened, reboot the HMC.
3. Verify that the network connection between the HMC, managed system, managed system partitions, and other HMCs is working properly.
4. If applicable, service the next FRU. See Chapter 3, “Locating FRUs,” on page 347 for instructions.
5. If the problem continues to persist, contact your next level of support. **This ends the procedure.**

FSPSP34

The memory cards are plugged in an invalid configuration and cannot be used by the system.

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

1. Is the SRC B1xx C02A?

Yes: A memory module is missing from the system. The additional parts in the FRU callout list will include all memory modules in the group with the missing card. To correct the error, visually check the system to determine which of these missing is missing, and add the module. **This ends the procedure.**

No: Continue with the next step.

2. Is the SRC B1xx C029?

Yes: A memory module is a different type than the other memory modules in the same group. The additional parts in the FRU callout list will include all memory modules in the group that contain the error. To correct the error, exchange the memory modules of the incorrect type with those of the desired type. **This ends the procedure.**

No: Continue with the next step.

3. Is the SRC B1xx C02B?

Yes: A group of memory modules are missing and are required so that other memory modules on the board can be configured. The additional parts in the FRU callout list will include all missing memory modules in the group. To correct the error, add or remove these modules to the desired locations. **This ends the procedure.**

No: Continue with the next step.

4. Is the SRC B1xx C036?

Yes: A memory module isn’t supported by this system. The additional parts in the FRU callout list will include all memory modules in the group that contains the unsupported modules. To correct the error, remove these modules from the system or replace them with the correct type. **This ends the procedure.**

No: Perform problem analysis using the to correct the problem. **This ends the procedure.**

FSPSP35

The system has detected a problem with a memory controller.

Perform the following to enable redundant utilization:

1. Power off the system (see “Powering on and powering off” on page 641).
2. “Performing a slow boot” on page 722. **This ends the procedure.**

FSPSP36

One or both of the SMP cables connecting the system processor cards on this system are incorrectly plugged, broken, or not the correct type of cable for this system configuration.

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

Perform the following:

1. Re-plug the SMP cables (P2-Cx-T1 or P2-Cx-T2) that connect to the system processor cards.
2. Perform a slow boot.
3. Does the problem persist?

Yes: Continue with the next step.

No: This ends the procedure.

4. Replace the SMP cables.
5. Perform a slow boot.
6. Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

7. Perform the following for each system processor card:
 - a. Power off the system (see “Powering on and powering off” on page 641).
 - b. Remove processor card one in the primary unit.
 - c. Perform a slow boot.
 - d. Does the problem persist?

Yes: Reinstall the processor card you removed and then repeat this step removing each of the processor cards, one at a time, until all of the processor cards have been removed. Perform a slow boot after removing each card. If you have removed the last processor card and the problem persists, contact your next level of support.

No: Replace the processor you just removed, it is the failing FRU. **This ends the procedure.**

FSPSP38

The system has detected an error within the JTAG path. If the FRU replaced before this procedure did not correct the problem, perform the following:

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions on replacing any FRUs called out by this procedure.

1. Was the FRU called out before this procedure a Memory DIMM (Un-P2-C1-Cx or Un-P2-C2-Cx)?

No: Go to step 10 on page 233

Yes: A Memory DIMM attention line has an error. Continue to the next step.

2. Replace the Service Processor (Un-P1-C11) from the same drawer as the Memory DIMM.
3. Perform a slow boot.
4. Does the problem persist?

No: This ends the procedure.

Yes: Continue to the next step.

5. Replace the Processor Card (Un-P2-C1 or Un-P2-C2) on which you previously replaced DIMMs.
6. Perform a slow boot.
7. Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

8. Replace the System Backplane (Un-P1) from the same drawer as the Memory DIMM.
9. Perform a slow boot. **This ends the procedure.**

10. Was the FRU called out before this procedure a Processor Card (Un-P2-C1 or Un-P2-C2) or GX Adapter Card (Un-P1-C8 or Un-P1-C9)?
 - No:** Go to step 16
 - Yes:** A Processor Card or GX Adapter Card attention line has an error. Continue to the next step.
11. Replace the Service Processor (Un-P1-C11) from the same drawer as the Processor Card or GX Adapter Card.
12. Perform a slow boot.
13. Does the problem persist?
 - No: This ends the procedure.**
 - Yes:** Continue with the next step.
14. Replace the System Backplane (Un-P1) from the same drawer as the Processor Card or GX Adapter Card.
15. Perform a slow boot. **This ends the procedure.**
16. Was the FRU called out before this the System Backplane (Un-P1)?
 - No:** Contact your next level of support. **This ends the procedure.**
 - Yes:** A P5IOC2 attention line has an error. Continue to the next step.
17. Replace the Service Processor (Un-P1-C11) from the same drawer as the System Backplane.
18. Perform a slow boot. **This ends the procedure.**

FSPSP42

An error communicating between two system processors was detected.

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

If you were unable to correct the problem by replacing FRUs that were previously specified before coming to this procedure, consider the possibility of failing system backplanes.

1. Use the location codes for the FRUs that were previously specified to determine if the system processors are on separate nodes. Are the system processors on separate nodes?
 - **No:** Continue with step 2.
 - **Yes:** Do the following:
 - a. Power off the system (see “Powering on and powering off” on page 641).
 - b. Replace the SMP cables between the two enclosures.
 - c. Perform a slow boot.
 - d. Is the problem resolved?
 - Yes: This ends the procedure.**
 - No:** Continue with the next step.
2. Power off the system.
3. Replace the bad node backplane.
4. Perform a slow boot. **This ends the procedure.**

FSPSP45

The system has detected an error with FSI path.

1. Replace the Flex System Cable (location P1-C11-T5) that connects the FRUs listed in the FRU list. See Chapter 3, “Locating FRUs,” on page 347 for instructions.
2. Perform a slow boot. Refer to “Performing a slow boot” on page 722

FSPSP46

Some corrupt areas of flash or RAM have been detected on the service processor.

1. Replace the system backplane (Un-P1). See Chapter 3, "Locating FRUs," on page 347 for instructions.
2. Perform a slow boot. Refer to "Performing a slow boot" on page 722.

This ends the procedure.

FSPSP47

The system has detected an error within the PSI link. To resolve the problem, perform the following:

Refer to Chapter 3, "Locating FRUs," on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

1. Replace the service processor.
2. Perform a slow boot.
3. Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

4. Replace the processor cards one at a time.
5. Perform a slow boot.
6. Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

7. Replace the system backplane.
8. Perform a slow boot. **This ends the procedure.**

FSPSP48

A diagnostic function detects an external processor interface problem. If replacing the FRUs previously listed in the FRU list do not fix the problem, perform the following:

1. Power off the system (see "Powering on and powering off" on page 641).
2. Replace the SMP cable (P2-Cx-T1 or P2-Cx-T2) that attaches the two nodes that were called out before this procedure. Refer to Chapter 3, "Locating FRUs," on page 347 for instructions.
3. Perform a slow boot.

FSPSP49

A diagnostic function detects an internal processor interface problem. If replacing the FRUs previously listed in the FRU list do not fix the problem, perform the following:

1. Power off the system.
2. Replace the regulator distribution backplane (Un-P2). Refer to Chapter 3, "Locating FRUs," on page 347 for instructions.
3. Perform a slow boot..

FSPSP50

A diagnostic function detects a connection problem between a processor chip and a GX chip. If replacing the FRUs previously listed in the FRU list do not fix the problem, perform the following:

1. Power off the system (see "Powering on and powering off" on page 641).
2. Replace the mid-plane backplane (Un-P1). Refer to Chapter 3, "Locating FRUs," on page 347 for instructions.
3. Perform a slow boot. **This ends the procedure.**

FSPSP51

Runtime diagnostics detected a memory bus correctable error that is exceeding the threshold. The memory bus correctable error will not cause an immediate loss of system operations. However, the system is operating in a degraded mode. To resolve the problem, perform the following:

Replace the FRU that is listed in the FRU list after this procedure. Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions.

FSPSP52

A problem has been detected on a memory bus. If the FRUs replaced before this procedure did not resolve the problem, perform the following:

1. Replace the Processor Card on which DIMMs were previously replaced. Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions.
2. Perform a slow boot. Refer to “Performing a slow boot” on page 722

FSPSP54

A processor over-temperature has been detected. Check for any environmental issues before replacing any parts.

1. Is the ambient room temperature in the normal operating range (less than 35 degrees C/95 degrees F)?
No: Notify the customer. The customer must bring the room temperature down so that it is within the normal range. Do not replace any parts. **This ends the procedure.**
Yes: Continue to next step.
2. Are the front and rear of the CEC drawer, and the front and rear rack doors, free of obstructions that would impede the airflow through the drawer?
No: Notify the customer. The system must be free of obstructions for proper airflow. Clean the air inlets and exits in the drawer as required. Do not replace any parts. **This ends the procedure.**
Yes: Continue to next step.
3. Are all of the fans in the drawer, especially those at the back of the power supply, functioning normally?
No: Replace any fans that are not turning or are turning slowly. Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions. **This ends the procedure.**
Yes: There are no environmental issues with the cooling of the processors. **This ends the procedure.**

FSPSP55

An error has been detected on a bus between two FRUs. The endpoint FRUs have been called out, however, the source of the error could be the bus path between the FRUs.

Refer to Chapter 3, “Locating FRUs,” on page 347 for instructions for removing and replacing any FRUs called out by the following procedure.

1. Is word 6 (the 8 leftmost characters of Panel function 13) of the reference code 00000001 or 00000008?
No: Go to the next step.
Yes: Perform the following:
 - a. The XYZ bus or the Processor - P5IOC2 bus has an error. Replace the FRUs called out after this procedure.
 - b. Did replacing the FRUs correct the problem?

Yes: This ends the procedure.

No: Perform the following:

- c. Replace the Regulator Distribution Backplane (Un-P2) from the drawer the FRUs were replaced.
- d. Perform a slow boot. **This ends the procedure.**

2. Is word 6 of the reference code 00000002?

No: Go to the next step.

Yes: Perform the following:

- a. The AB bus has an error. Replace the SMP Cable (Un-P2-Cx-Tx is the connector location) between the FRUs called out after this procedure.
- b. Clear the deconfiguration errors for the FRUs called out.
- c. Perform a slow boot.
- d. Did replacing the SMP Cable correct the problem?

Yes: This ends the procedure.

No: Perform the following:

- e. Replace the FRUs called out after this procedure. **This ends the procedure.**

3. Is word 6 of the reference code 00000004 or 00000005?

No: Go to the next step.

Yes: Perform the following:

- a. The Processor - GX Card bus or PSI bus has an error. Replace the FRUs called out after this procedure.
- b. Did replacing the FRUs correct the problem?

Yes: This ends the procedure.

No: Perform the following:

- c. Replace the Regulator Distribution Backplane (Un-P2) from the drawer where the FRUs were replaced.
- d. Perform a slow boot. Does the problem persist?

No: This ends the procedure.

Yes: Perform the following:

- e. Replace the System Backplane (Un-P1) from the drawer where the FRUs were replaced.
- f. Perform a slow boot. **This ends the procedure.**

4. Is word 6 of the reference code 00000006?

No: Go to the next step.

Yes: Perform the following:

- a. The DIMM - DIMM bus has an error. Replace the FRUs called out after this procedure.
- b. Did replacing the FRUs correct the problem?

Yes: This ends the procedure.

No: Perform the following:

- c. Replace the Processor Card (Un-P2-C1 or Un-P2-C2) from the drawer where the FRUs were replaced.
- d. Perform a slow boot. **This ends the procedure.**

5. For any other value in word 6 of the reference code, the bus error is corrected by the FRUs called out after this procedure. Replace the FRUs called out after this procedure. **This ends the procedure.**

FSPSP63

The system has experienced a power error. Please review previous error logs for power-related issues.

FSPSP64

All the processor support interface (PSI) links of the system are either nonfunctional or deconfigured, so the system cannot perform an IPL appropriately. Look for previous error logs that deconfigure hardware.

FSPSPC1

If the system hangs after the code that sent you to this procedure appears in the control panel, perform these steps to reset the service processor.

Attention: You should periodically check the system firmware level on all your servers and update the firmware to the latest level, if appropriate. If you were directed to this procedure because the server displayed B1817201, C1001014, or C1001020, or a combination of these codes, the latest firmware can help avoid a recurrence of this problem.

Even if the customer cannot update the firmware on this system at this time, all of their systems should be updated to the latest firmware level as soon as possible to help prevent this problem from occurring on other systems.

Are you servicing a model 570 with multiple drawers?

Yes: Verify that the anchor VPD card is present in the first (top) drawer, and that an anchor VPD card is not installed in any of the other processor drawers. If there are problems with the configuration of the anchor VPD card, correct them, and reapply AC power. If the service processor comes up to standby mode, this ends the procedure. If the service processor still fails early in the boot process, or the anchor VPD card was configured correctly, continue to the next step.

No: Continue with the next step.

Select the procedure that applies to the system on which you are working.

- Systems with a physical control panel
- Systems with a logical control panel

Resetting the service processor on systems with a physical control panel

1. If the Advanced System Management Interface (ASMI) is available, reset the service processor using the ASMI menus.

Were you able to use the ASMI menus to reset the service processor?

Yes: This ends the procedure.

No: Continue with the next step.

2. Activate the service processor pinhole reset switch on the system's operator panel by carefully performing these steps:
 - a. Using an insulated paper clip, unbend the clip so that it has a straight section about two inches long.
 - b. Insert the clip straight into the hole, keeping the clip perpendicular to the plastic bezel.
 - c. When you engage the reset switch, you should feel the detent of the switch. Pressing the reset switch resets the service processor and causes the system to shut down.
3. Reboot the system in slow mode from the permanent side using control panel function 02 or the ASMI menus, if available.
4. If the hang repeats, check with service support to see if a firmware update is available that fixes the problem. For more information, see *Service Guide for the Hardware Management Console Models 7042-CR4, 7042-C06 and 7042-C07, SA76-0120*.
5. Choose from the following options:

- If no firmware update is available, continue with the next step.
- If a firmware update is available, apply it using the Hardware Management Console (HMC).
Did the update resolve the problem so that the system now boots?

Yes: This ends the procedure.

No: You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.

- Choose from the following options:
 - If you are a customer, contact your authorized hardware service provider. **This ends the procedure.**
 - If you are a customer and your system has a secondary service processor, use the HMC to initiate a service processor failover and continue to bring up the system. Contact your authorized service provider to schedule deferred maintenance on the service processor that is not working. **This ends the procedure.**
 - If you are the authorized hardware service provider, continue with the next step.
- Replace the service processor (see symbolic FRU Chapter 3, "Locating FRUs," on page 347).
- If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

Resetting the service processor on systems with a logical control panel

- Reset the service processor.
 - On the 9117-MMA, use the Advanced System Management Interface (ASMI) menus, if available, or the Hardware Management Console (HMC) first to remove then to reapply power to the service processor.
- Using the setting in the ASMI menu, reboot the system in slow mode from the permanent side.
- If the hang repeats, check with service support to see if a firmware update is available that fixes the problem. For more information, see *Service Guide for the Hardware Management Console Models 7042-CR4, 7042-C06 and 7042-C07, SA76-0120*.
- Choose from the following options:
 - If no firmware update is available, continue with the next step.
 - If a firmware update is available, apply it using the Hardware Management Console (HMC).
Did the update resolve the problem so that the system now boots?
Yes: This ends the procedure.
No: You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.
- Choose from the following options:
 - If you are a customer, contact your authorized hardware service provider. **This ends the procedure.**
 - If you are a customer and your system has a secondary service processor, use the HMC to initiate a service processor failover and continue to bring up the system. Contact your authorized service provider to schedule deferred maintenance on the service processor that is not working. **This ends the procedure.**
 - If you are the authorized hardware service provider, continue with the next step.
- Replace the service processor (see Chapter 3, "Locating FRUs," on page 347).
- If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

FSPSPD1

If the system hangs after the code that sent you to this procedure appears in the control panel, perform these steps to reset the service processor.

Attention: You should periodically check the system firmware level on all your servers and update the firmware to the latest level, if appropriate. If you were directed to this procedure because the server displayed B1817201, C1001014, or C1001020, or a combination of these codes, the latest firmware can help avoid a recurrence of this problem.

Even if the customer cannot update the firmware on this system at this time, all of their systems should be updated to the latest firmware level as soon as possible to help prevent this problem from occurring on other systems.

Are you servicing a model 570 with multiple drawers?

Yes: Verify that the anchor VPD card is present in the first (top) drawer, and that an anchor VPD card is not installed in any of the other processor drawers. If there are problems with the configuration of the anchor VPD card, correct them, and reapply AC power. If the service processor comes up to standby mode, this ends the procedure. If the service processor still fails early in the boot process, or the anchor VPD card was configured correctly, continue to the next step.

No: Continue with the next step.

Select the procedure that applies to the system on which you are working.

- Systems with a physical control panel
- Systems with a logical control panel

Resetting the service processor on systems with a physical control panel

1. If the Advanced System Management Interface (ASMI) is available, reset the service processor using the ASMI menus.

Were you able to use the ASMI menus to reset the service processor?

Yes: This ends the procedure.

No: Continue with the next step.

2. Activate the service processor pinhole reset switch on the system control (operator) panel by carefully performing these steps:
 - a. Using an insulated paper clip, unbend the clip so that it has a straight section about two inches long.
 - b. Insert the clip straight into the hole, keeping the clip perpendicular to the plastic bezel.
 - c. When you engage the reset switch, you should feel the detent of the switch. Pressing the reset switch resets the service processor and causes the system to shut down.
3. Reboot the system in slow mode from the permanent side using control panel function 02 or the ASMI menus, if available.
4. If the hang repeats, check with service support to see if a firmware update is available that fixes the problem. For more information, see *Service Guide for the Hardware Management Console Models 7042-CR4, 7042-C06 and 7042-C07, SA76-0120*.
5. Choose from the following options:
 - If no firmware update is available, continue with the next step.
 - If a firmware update is available, apply it the Hardware Management Console (HMC).

Did the update resolve the problem so that the system now boots?

Yes: This ends the procedure.

No: You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.

6. Choose from the following options:
 - If you are a customer, contact your authorized hardware service provider. **This ends the procedure.**

- If you are a customer and your system has a secondary service processor, use the HMC to initiate a service processor failover and continue to bring up the system. Contact your authorized service provider to schedule deferred maintenance on the service processor that is not working. **This ends the procedure.**
 - If you are the authorized hardware service provider, continue with the next step.
7. Replace the service processor (see Chapter 3, “Locating FRUs,” on page 347).
 8. If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

Resetting the service processor on systems with a logical control panel

1. Reset the service processor.
 - On the 9117-MMA, use the Advanced System Management Interface (ASMI) menus, if available, or the Hardware Management Console (HMC) first to remove then to reapply power to the service processor.
2. Using the setting in the ASMI menu, reboot the system in slow mode from the permanent side.
3. If the hang repeats, check with service support to see if a firmware update is available that fixes the problem. For more information, see *Service Guide for the Hardware Management Console Models 7042-CR4, 7042-C06 and 7042-C07, SA76-0120*.
4. Choose from the following options:
 - If no firmware update is available, continue with the next step.
 - If a firmware update is available, apply it using the Hardware Management Console (HMC).
Did the update resolve the problem so that the system now boots?
Yes: This ends the procedure.
No: You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.
5. Choose from the following options:
 - If you are a customer, contact your authorized hardware service provider. **This ends the procedure.**
 - If you are a customer and your system has a secondary service processor, use the HMC to initiate a service processor failover and continue to bring up the system. Contact your authorized service provider to schedule deferred maintenance on the service processor that is not working. **This ends the procedure.**
 - If you are the authorized hardware service provider, continue with the next step.
6. Replace the service processor (see Chapter 3, “Locating FRUs,” on page 347).
7. If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

Tape unit isolation procedures

This topic contains the procedures necessary to isolate a failure in a tape device.

In these procedures, the term *tape unit* may be any one of the following:

- An internal tape drive, including its electronic parts and status indicators
- An internal tape drive, including its tray, power regulator, and AMDs
- An external tape drive, including its power supply, power switch, power regulator, and AMDs

You should interpret the term *tape unit* to mean the tape drive you are working on. However, these procedures use the terms *tape drive* and *enclosure* to indicate a more specific meaning.

Read and observe all safety procedures before servicing the system and while performing the procedures in this topic. Unless instructed otherwise, always power off the system or expansion unit where the FRU is located (see “Powering on and powering off” on page 641) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

“TUPIP02” on page 243

Use this procedure to perform the 8mm tape drive read self-test and hardware self-test.

“TUPIP03” on page 245

You were directed here because you may need to exchange a failing part.

“TUPIP04” on page 246

Use this procedure to reset an IOP and its attached tape units. Read the (overview) before continuing with this procedure.

“TUPIP06” on page 250

Use this procedure to isolate a Device Not Found message during installation from an alternate device.

“Tape unit self-test procedure” on page 251

This procedure is designed to allow you to quickly perform a complete set of diagnostic tests on a 6384 or 6387 tape unit.

“Tape device ready conditions” on page 253

All the conditions that are listed for the device, must be correct for the device to be ready.

TUPIP02

Use this procedure to perform the 8mm tape drive read self-test and hardware self-test.

The write test is performed in “TUPIP03” on page 245.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see “Determining if the system has logical partitions” on page 646).
2. Press the **Unload** switch on the front of the 8mm tape drive. Is a data cartridge present?
 - **No:** Continue with the next step.
 - **Yes:** Attempt to remove the data cartridge. Can you remove the data cartridge?
 - Yes:** Continue with the next step.
 - No:** The tape drive is the failing part. Go to (Tape cartridge - Manual removal). After removing the data cartridge, exchange the tape drive (see Chapter 3, “Locating FRUs,” on page 347). **This ends the procedure.**
3. Clean the tape drive by using the cleaning cartridge (part 16G8467). If the tape drive ejects the cleaning cartridge with the Disturbance light on, a new cleaning cartridge is needed. The tape drive unloads automatically when cleaning is complete. Cleaning takes up to 5 minutes.

Is the Disturbance light on continuously?

 - **No:** Continue with the next step.
 - **Yes:** Repeat this step while using a new cleaning cartridge. If you are using a new cleaning cartridge and the Disturbance light does not go off, the possible failing part is the 8mm tape drive. Go to “TUPIP03” on page 245. **This ends the procedure.**
4. Is the Disturbance light blinking?
 - **No:** Continue with the next step.
 - **Yes:** Choose from the following:
 - If the 8mm tape drive is a type 6390, the possible failing part is the 6390 tape drive.
 - If the 8mm tape drive is a type 7208, the possible failing parts are:
 - a. 7208 tape drive
 - b. Power supply
 - c. AMD

Go to “TUPIP03” on page 245. **This ends the procedure.**
5. Perform the read self-test:

Notes:

- a. The 8mm tape drive read self-test and hardware self-test can take up to 5 minutes to run.
- b. The tape drive runs the read self-test first. During the read self-test, the Read-Write light blinks, and the Disturbance and Ready lights are off.

To start the read self-test and hardware self-test, insert the diagnostic cartridge (part 46G2660) into the tape drive. The following conditions indicate that the read self-test ended successfully:

- The Read-Write light stops blinking.
- The diagnostic cartridge ejects automatically.
- The three status lights go on to indicate the start of the hardware test.

Does the read self-test end successfully?

- **No:** Does the tape drive eject the diagnostic cartridge?
 - **Yes:** Continue with the next step.
 - **No:** The tape drive is the failing part.

Go to (Tape cartridge - Manual removal). After removing the diagnostic cartridge, exchange the tape drive (see Chapter 3, “Locating FRUs,” on page 347). **This ends the procedure.**

- **Yes:** Go to step 8.
6. Is the Disturbance light blinking approximately four times per second?
- **No:** Continue with the next step.
 - **Yes:** The possible failing part is the diagnostic cartridge (part 46G2660).
 - If this is your first time through this step, get a new diagnostic cartridge. Go to step 3 on page 243 of this procedure to clean the tape drive again. Afterwards, run the read self-test and hardware self-test while using the new diagnostic cartridge.
 - If this is your second time through this step, the possible failing part is the 8mm tape drive. Go to “TUPIP03” on page 245. **This ends the procedure.**
7. The Disturbance light is blinking approximately once per second.
- If the 8mm tape drive is a type 6390, the possible failing part is the 6390 tape drive.
 - If the 8mm tape drive is a type 7208, the possible failing parts are:
 - a. 7208 tape drive
 - b. Power supply
 - c. AMD

Go to “TUPIP03” on page 245. **This ends the procedure.**

8. The tape drive runs the hardware self-test. During the hardware self-test, the three tape drive status lights are on for 15 to 30 seconds. The three status lights go off when the hardware self-test ends successfully.

Does the hardware self-test end successfully?

- **Yes:** Continue with the next step.
- **No:** When the hardware self-test does not end successfully, the following conditions occur:
 - The three status lights do not go off.
 - The Ready and Read-Write lights go off.
 - The Disturbance light blinks approximately once per second.

Possible failing parts are:

- If the 8mm tape drive is a type 6390, the possible failing part is the 6390 tape drive.
- If the 8mm tape drive is a type 7208, the possible failing parts are:
 - a. 7208 tape drive
 - b. Power supply
 - c. AMD

Go to “TUPIP03” on page 245. **This ends the procedure.**

9. The read self-test and hardware self-test ended successfully.

Was the user’s original tape identified as the probable cause of failure?

- **Yes:** Perform the following:
 - a. Mark and date the data cartridge to indicate that it failed with a permanent error.
 - b. Discard this data cartridge when:
 - Volume statistics (if available) indicate a problem with the data cartridge.
 - A total of three permanent errors have occurred with the same data cartridge.
 - c. If possible, continue operations with a new data cartridge.

Go to “TUPIP03” on page 245. **This ends the procedure.**

- **No:** Go to “TUPIP03” on page 245. **This ends the procedure.**

TUPIP03

You were directed here because you may need to exchange a failing part.

The failing part was determined from one of the following:

- Other problem isolation procedures
- The *Failing item* column of the tape unit reference code table
- Tape unit service guide

Note: Occasionally, the system is available but not performing an alternate IPL (type D IPL). In this instance, any hardware failure of the tape unit I/O processor, or any device attached to it is not critical. With the exception of the loss of the affected devices, the system remains available.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see “Determining if the system has logical partitions” on page 646).
2. Do you need to exchange a possible failing device?
 - **No:** Do you need to exchange the tape unit I/O processor?
 - No:** Continue with the next step.
 - Yes:** Exchange the tape unit I/O processor (see Chapter 3, “Locating FRUs,” on page 347). When you have completed the remove and replace procedure, continue with the next step.
 - **Yes:** Perform the following:
 - For an internal tape unit, go to Chapter 3, “Locating FRUs,” on page 347.
 - For an external tape unit, go to the remove and replace procedures in the device service information.
3. Are you working with a tape unit in the system unit or in an expansion unit?
 - **Yes:** Is the system available, and can you enter commands on the command line?
 - No:** Continue with the next step.
 - Yes:** Go to step 9 on page 246.
 - **No:** Continue with the next step.
4. Display the selected IPL type.

Is the displayed IPL type D?

 - **No:** Do you want to perform an alternate IPL (type D)?
 - No:** Continue with the next step.
 - Yes:** Go to step 6.
 - **Yes:** Go to step 6.
5. Perform an IPL from disk by doing the following:
 - a. Power off the system (see “Powering on and powering off” on page 641).
 - b. Select IPL type A in manual mode.
 - c. Power on the system.
 - d. Go to step 8.
6. Place the first tape of the latest set of SAVSYS tapes or SAVSTG tapes, or the first Software Distribution tape in the alternate IPL tape drive. The tape drive automatically becomes ready for the IPL operation (this may take several minutes).
7. Perform an alternate IPL by doing the following:
 - a. Power off the system.
 - b. Select IPL type D in Manual mode.
 - c. Power on the system.
8. The IPL may take one or more hours to complete.

Does an unexpected reference code appear on the control panel, and is the System Attention light on?

- **No:** Does the IPL complete successfully?

Yes: Continue with the next step.

No: Perform problem analysis to continue analyzing the problem. **This ends the procedure.**

- **Yes:** Go to step 10.

9. Perform the following to test the tape unit:

- a. Enter VFYTAP (the Verify Tape command) on the command line.
- b. Follow the prompts on the Verify Tape displays, then return here and answer the following question.

Does the VFYTAP command end successfully?

No: Continue with the next step.

Yes: **This ends the procedure.**

10. Record the SRC.

Is the SRC the same one that sent you to this procedure?

Yes: You cannot continue to analyze the problem. Use the original SRC and exchange the FRUs. Begin with the FRU which has the highest percent of probable failure (see the failing item list for this reference code). **This ends the procedure.**

No: A different SRC occurred. Use the new SRC to correct the problem. **This ends the procedure.**

TUPIP04

Use this procedure to reset an IOP and its attached tape units. Read the (overview) before continuing with this procedure.

If disk units are attached to an IOP, you must power off the system, then power it on to reset the IOP.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see "Determining if the system has logical partitions" on page 646).
2. Is the tape unit powered on?

- **No:** Continue with the next step.
- **Yes:** Perform the following:
 - a. Press the Unload switch on the front of the tape unit you are working on.
 - b. If a data cartridge or a tape reel is present, do not load it until you need it.
 - c. Continue with the next step of this procedure.

3. Verify the following:

- If the external device has a power switch, ensure that it is set to the **On** position.
- Ensure that the power and external signal cables are connected correctly.

Note: For every 8mm and 1/4 inch tape unit, the I/O bus terminating plug for the SCSI external signal cable is connected internally. These devices do not need and should not have an external terminating plug.

4. Did you press the Unload switch in step 2?

- **Yes:** Can you enter commands on the command line?

Yes: Continue with the next step.

No: Go to step 11 on page 248.
- **No:** Press the **Unload** switch on the front of the tape unit you are working on. If a data cartridge or a tape reel is present, do not load it until you need it. Continue with the next step of this procedure.

5. Has the tape unit operated correctly since it was installed? If you do not know, continue with the next step of this procedure.
 - Yes:** Continue with the next step.
 - No:** Go to step 11 on page 248.
6. If a system message displayed an I/O processor name, a tape unit resource name, or a device name, record the name for use in the next step. You may continue without a name.

Does the I/O processor give support to only one tape unit? If you do not know, continue with the next step of this procedure.

 - **No:** Continue with the next step.
 - **Yes:** Perform the following. You must complete all parts of this step before you press **Enter**.
 - a. Enter


```
WRKCFGSTS *DEV *TAP ASTLVL(*INTERMED)
```

(the Work with Configuration Status command) on the command line.
 - b. If the device is not varied off, select **Vary off** before continuing.
 - c. Select **Vary on** for the failing tape unit.
 - d. Enter


```
RESET(*YES)
```

(the Reset command) on the command line.
 - e. Press **Enter**. **This ends the procedure.**
7. This step determines if the I/O processor for the tape unit gives support to other tape units or to a disk unit.

Notes:

- a. If you cannot determine the tape unit you are attempting to use, go to step 11 (See 11 on page 248).
- b. System messages refer to other tape units that the I/O processor gives support to as *associated devices*.

Enter WRKHDWRSC *STG (the Work with Hardware Resources command) on the command line.

Did you record an I/O processor (IOP) resource name in step 6?

- **No:** Perform the following:
 - a. Select **Work with resources** for each storage resource IOP (CMB01, SIO1, and SIO2 are examples of storage resource IOPs).
 - b. Find the Configuration Description name of the tape unit you are attempting to use, and then record the Configuration Description names of all tape units that the I/O processor gives support to.
 - c. Record whether the I/O processor for the tape unit also gives support to any disk unit resources.
 - d. Continue with the next step.
 - **Yes:** Perform the following:
 - a. Select **Work with resources** for that resource.
 - b. Record the Configuration description name of all tape units for which the I/O processor provides support.
 - c. Record whether the I/O processor for the tape unit also gives support to any disk unit resources.
 - d. Continue with the next step.
8. Does the I/O processor give support to any disk unit resources?
 - No:** Continue with the next step.

Yes: The **Reset** option is not available. Go to step 11.

9. Does the I/O processor give support to only one tape unit?

- **No:** Continue with the next step.
- **Yes:** Perform the following:
 - a. Select **Work with configuration description** and press **Enter**.
 - b. Select **Work with status** and press **Enter**.

Note: You must complete the remaining parts of this step before you press **Enter** again.

- c. If the device is not varied off, select **Vary off** before continuing.
- d. Select **Vary on** for the failing tape unit.
- e. Enter RESET (*YES) (the Reset command) on the command line.
- f. Press **Enter**. **This ends the procedure.**

10. Perform the following:

a. Enter

```
WRKCFGSTS *DEV *TAP ASTLVL(*INTERMED)
```

(the Work with Configuration Status command) on the command line.

b. Select **Vary off** for the failing tape unit and associated devices (the devices you identified in step 7 on page 247), and then press **Enter**.

Note: You must complete the remaining parts of this step before you press **Enter** again.

c. Select **Vary on** for the failing tape unit.

d. Enter

```
RESET(*YES)
```

(the Reset command) on the command line.

e. Press **Enter**.

f. Select **Vary on** for the associated devices (tape units) you identified in step 7 on page 247. It is not necessary to use the **Reset** option again.

Does a system message indicate that the vary on operation failed?

Yes: Continue with the next step.

No: **This ends the procedure.**

11. The **Reset** is not available, or you were not able to find the Configuration Description name when using

```
WRKHDWRSC *STG
```

(the Work with Hardware Resources command).

You can perform an I/O processor (IOP) reset by performing an IPL of the I/O processor. All devices that are attached to the IOP will reset.

The following steps describe how to load an IOP, how to configure a tape drive, how to vary on tape devices, and how to make tape devices available.

12. Is the tape device you are working on an 8mm tape drive?

- **No:** Continue with the next step.
- **Yes:** Verify the following on the 8mm tape drive:
 - The power and external signal cables are connected correctly.
 - The Power switch is set to the On position (pushed in).

Note: The SCSI I/O bus terminating plug for the system-external signal cables is connected internally in the 8mm tape drive. The 8mm tape drive does not need, and must not have an external terminating plug.

Is the 8mm tape drive Power light on, and is the Disturbance light off?

Yes: Continue with the next step.

No: Go to “TUPIP02” on page 243 to correct the problem. **This ends the procedure.**

13. Is a data cartridge or a tape reel installed in the tape device?

No: Continue with the next step.

Yes: Remove the data cartridge or tape reel. Continue with the next step.

14. Can you enter commands on the command line?

- **Yes:** Continue with the next step.

- **No:** Perform the following:

- a. Power off the system (see “Powering on and powering off” on page 641).

- b. Power on the system.

The system performs an IPL and resets all devices. If the tape device responds to SCSI address 7, the system configures the tape device. **This ends the procedure.**

15. Verify that automatic configuration is on by entering

DSPSYSVAL QAUTOCFG

(the Display System Value command) on the command line.

Is the **Autoconfigure device** option set to 1?

- **Yes:** Continue with the next step.

- **No:** Perform the following:

- a. Press **Enter** to return to the command line.

- b. Set automatic configuration to On by entering

CHGSYSVAL QAUTOCFG '1'

(the Change System Value command) on the command line.

Note: QAUTOCFG resets to its initial value in step 21 on page 250.

- c. Continue with the next step.

16. Perform the following:

- a. Enter

STRSST

(the Start SST command) on the command line.

- b. On the Start Service Tools Sign On display, type in a User ID with QSRV authority and Password.

- c. Select **Start a Service Tool** → **Hardware Service Manager** → **Logical Hardware Resources** → **System Bus Resources**. The Logical Hardware Resources on System Bus display shows all of the IOPs.

- d. Find the IOP you want to reset. You **must** ensure that no one is using any of the tape units, communication channels, or display stations that are attached to the IOP you want to reset.

Does a “*” indicator appear to the right of the IOP description?

- **No:** Continue with the next step.

- **Yes:** Disk units are attached to the IOP.

Perform the following:

- a. Press **F3** until the Exit System Service Tools display appears.

- b. Press **Enter**.

- c. Power off the system (see “Powering on and powering off” on page 641).
- d. Power on the system.

The system performs an IPL and resets all devices. **This ends the procedure.**

17. Perform the following:

- a. Select **I/O debug** → **IPL the I/O processor**.
- b. When the IOP reset is complete, continue with the next step of this procedure.

18. Perform the following:

- a. Press **F12** to return to the Logical Hardware Resources on System Bus display.
- b. Select **Resources associated with IOP** for the IOP you reset.

Did the IOP detect the tape unit?

- **Yes:** Continue with the next step.
- **No:** The IOP did not detect the tape unit. Consider the following:
 - Ensure that the tape unit is powered on and that the signal cables are connected correctly. If you find and correct a power or a signal cable problem, return to step 16 on page 249.
 - The tape unit may be failing. Go to the tape unit service information and perform the procedures for analyzing device problems. If you find and correct a tape unit problem, return to step 16 on page 249.
 - If none of the above are true, ask your next level of support for assistance. **This ends the procedure.**

19. Press **F3** until the Exit System Service Tools display appears. Then press **Enter**.

20. Was automatic configuration Off before you performed step 15 on page 249?

Yes: Continue with the next step.

No: **This ends the procedure.**

21. Enter

CHGSYSVAL QAUTOCFG '0'

(the Change System Value command) on the command line to reset QAUTOCFG to its initial value.

This ends the procedure.

TUPIP06

Use this procedure to isolate a Device Not Found message during installation from an alternate device.

There are several possible causes:

- The alternate installation device was not correctly defined.
- The alternate installation device was not made ready.
- The alternate installation device does not contain installation media.
- The alternate installation device is not powered on.
- The alternate installation device is not connected properly.
- There is a hardware error on the alternate installation device or the attached I/O processor.

Read the danger notices in “Tape unit isolation procedures” on page 241 before continuing with this procedure.

1. Is the device that you are using for alternate installation defined as the alternate installation device?

- **Yes:** Is the alternate installation device ready?

Yes: Continue with the next step.

No: Make the alternate installation device ready and retry the alternate installation. **This ends the procedure.**

- **No:** Correct the alternate installation device information and retry the alternate installation. **This ends the procedure.**
2. Is there installation media in the alternate installation device?
 - **Yes:** Is the alternate installation device an external device?
 - Yes:** Continue with the next step.
 - No:** Go to step 5.
 - **No:** Load the correct media and retry the alternate installation. **This ends the procedure.**
 3. Is the alternate installation device powered on?
 - **Yes:** Make sure that the alternate installation device is properly connected to the I/O processor or I/O adapter card.
Is the alternate installation device properly connected?
 - Yes:** Go to step 5.
 - No:** Correct the problem and retry the alternate installation. **This ends the procedure.**
 - **No:** Continue with the next step.
 4. Ensure that the power cable is connected tightly to the power cable connector at the back of the alternate device. Ensure that the power cable is connected to a power outlet that has the correct voltage. Set the alternate device Power switch to the Power On position.
The Power light should go on and remain on. If a power problem is present, one of the following power failure conditions may occur:
 - The Power light flashes, then remains off.
 - The Power light does not go on.
 - Another indication of a power problem occurs.
 Does one of the above power failure conditions occur?
 - **No:** The alternate device is powered on and runs its power-on self-test. Wait for the power-on self-test to complete.
Does the power-on self-test complete successfully?
 - No:** Go to the service information for the specific alternate installation device to correct the problem. Then retry the alternate installation. **This ends the procedure.**
 - Yes:** Retry the alternate installation. **This ends the procedure.**
 - **Yes:** Perform the following:
 - a. Go to the service information for the specific alternate device to correct the power problem.
 - b. When you have corrected the power problem, retry the alternate installation. **This ends the procedure.**
 5. Was a device error recorded in the Product Activity Log?
 - No:** Contact your next level of support. **This ends the procedure.**
 - Yes:** See Reference codes to correct the problem. **This ends the procedure.**

Tape unit self-test procedure

This procedure is designed to allow you to quickly perform a complete set of diagnostic tests on a 6384 or 6387 tape unit.

The following procedure is designed to allow you to quickly perform a complete set of diagnostic tests on a 6384 or 6387 tape unit, without impacting your system operation. This test can also be used to verify good performance of individual tape cartridges.

Enter diagnostic mode:

1. Verify that a cartridge is not loaded in the tape unit. To unload a cartridge, press the **eject** button on the front of the tape unit. If the cartridge does not eject, refer to (Tape unit - manual removal).

2. Press and hold the **eject** button for about 6 seconds until the amber LED starts flashing slowly, then release the button. The amber (left) LED will flash, indicating that the tape unit is waiting for a cartridge to be inserted.

Running the self-test

1. Self-testing begins when a scratch data cartridge is inserted into the tape unit. The Ready (left) LED will flash, indicating that self-testing is in progress.

Note: A cartridge must be loaded within 15 seconds, otherwise, the tape unit will automatically revert back to normal operation. If necessary, return to step 1 on page 251 to reenter diagnostic mode.

2. For fastest results, we recommend using an SLR100 Test Tape (P/N 35L0967) which was originally provided with your iSeries™ server.

Attention: Use a blank cartridge that does not contain customer data. During this self-test, the cartridge will be rewritten with a test pattern and any customer data will be destroyed.

Note: Use a cartridge that is not write-protected. If a write-protected cartridge is inserted while the tape unit is in diagnostic mode, the cartridge will be ejected, see Incorrect cartridge below.

Self-testing will only be performed using a write-compatible cartridge type, and with a cartridge that is not damaged, see Incorrect cartridge below.

If a cleaning cartridge is inserted while the tape unit is in diagnostic mode, drive cleaning will occur and the tape unit will then return to normal operating mode. Return to step 1 on page 251 to reenter diagnostic mode.

3. **At any time, self-testing can be stopped by pressing the eject button.** After the current operation is completed, the cartridge will be ejected and tape unit will return to normal operating mode.
4. The Ready (left) LED will continue to flash during the following:
 - The **cartridge load sequence** has a approximate duration of 30 seconds. The center LED indicates tape movement.
 - The **hardware test** has an approximate duration of 2 and 1/2 minutes. During that time, a static test is performed on tape unit electrical components. No tape motion occurs during this step.
 - The **cartridge load/unload test** has an approximate duration of 1 and 1/2 minutes. During that time, the Ready LED will continue to flash while a dynamic test is performed on tape unit mechanical components. Two cartridge load cycles are included.
 - Duration of the **write/read test** will vary, depending on what type of cartridge is loaded into the tape unit. When an SLR100 Test Tape is used, typical duration will be 5 minutes. Use of other cartridge types can increase the write/read test duration to 30-40 minutes. During this test, the Ready LED will continue to flash. The center LED indicates tape movement.

Interpreting the results

Test Passed: When self-testing has completed successfully, and no problems are detected, the cartridge is unloaded from the tape unit and all LEDs are off. Proper function of both the tape unit and tape cartridge have now been verified.

Note: A solid amber light indicates that self-testing has completed successfully, but the tape unit requires cleaning. Clean the tape unit by inserting an Dry Process Cleaning Cartridge (P/N 35L0844).

Test Failed: The cartridge will remain loaded inside the tape unit, and the amber LED will flash when a problem is detected with either the tape unit or cartridge.

Note: To isolate failure to either tape unit or cartridge, return to step 1 on page 251 and repeat this self-test using a different scratch cartridge.

Incorrect cartridge: When the center (green) and right (amber) LEDs flash and a cartridge is unloaded, the tape unit has determined that an incorrect tape cartridge has been inserted, and self-testing cannot be performed. Verify that your tape cartridge is **not** one of the following:

- Write-protected
- Damaged
- Unsupported media type
- Media which is not write-compatible with tape unit.

Press the **eject** button, to end self-test and return the tape unit to normal operating mode. Then return to step 1 on page 251 and run the self-test using another cartridge, or one which is not write-protected. **This ends the procedure.**

Tape device ready conditions

All the conditions that are listed for the device, must be correct for the device to be ready.

If the device is not ready, use the Action column or other instructions, and go to the service information for the specific tape device.

If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see “Determining if the system has logical partitions” on page 646).

Table 39. Tape device ready conditions

Storage device	Ready description	Action
3480 or 3490	<ul style="list-style-type: none"> • Power switch is set to the On position. • Power light is on. • DC Power light is on. • Control unit On-line switch is set to the On-line position. • Control unit Normal/Test switch is set to the Normal position. • Control unit channel Enable/Disable switch is set to the Enable position. • Tape unit On-line/Off-line switch is set to the On-line position. • Tape is loaded. • Tape unit displays Ready U or Ready F. 	See the <i>3480 Magnetic Tape Subsystem Operator's Guide</i> , SA32-0066, or <i>3490 Magnetic Tape Subsystem Operator's Guide</i> , SA32-0124, for instructions on making the tape unit ready.

Table 39. Tape device ready conditions (continued)

Storage device	Ready description	Action
7208	<ul style="list-style-type: none"> • Power switch is on (pressed). • Power light is on. • Data cartridge is inserted. • Ready light is on. • System external signal cable is connected to the type 2621 I/O processor and to the 7208 tape drive. <p>Note: The SCSI I/O bus terminating plug for the system external signal cable is connected internally in the 7208 tape drive. The 7208 tape drive does not need, and must not have, an external terminating plug.</p>	See the <i>7208 8 mm Tape Drive Operator's Manual</i> for instructions on making the tape drive ready. If you cannot make the 7208 Model 012 tape drive ready, go to "TUPIP02" on page 243.
9348	<ul style="list-style-type: none"> • Power switch is set to the On position. • Power light is on. • Tape is loaded. • Status display shows 00 A002. • On-line light is on. 	See the <i>9348 Customer Information</i> manual, SA21-9567, for instructions on making the tape unit ready. If you cannot make the tape unit ready, go to the "Analyzing Problems" section of <i>9348 Tape Unit Service Information</i> , SY31-0697.

Twinaxial workstation I/O processor isolation procedure

Use the procedure below to isolate a failure which has been detected by the twinaxial workstation I/O processor. If you are using a personal computer, an emulation program must be installed and working.

Please read and observe all safety procedures before servicing the system and while performing the procedure below.

Attention: Unless instructed otherwise, always power off the system or expansion tower where the FRU is located (see “Powering on and powering off” on page 641) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

Attention: When instructed, remove and connect cables carefully. You may damage the connectors if you use too much force.

“TWSIP01” on page 256

The workstation IOP detected an error.

TWSIP01

The workstation IOP detected an error.

Please read the danger notices in “Twinaxial workstation I/O processor isolation procedure” on page 255 before performing this procedure.

One of the following occurred:

- All of the workstations on one port are not working.
 - All of the workstations on the system are not working.
 - One of the workstations on the system is not working.
 - The reference code table instructed you to perform this procedure.
 - The Remote Operations Console is not working.
1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646 before continuing with this procedure.
 2. Are you using a workstation adapter console?

Note: A personal computer (used as a console) that is attached to the system by using a console cable feature is known as a workstation adapter console. The cable (part number 46G0450, 46G0479, or 44H7504) connects the system port on the personal computer to a communications I/O adapter on the system.

No: Continue with the next step.

Yes: Go to “WSAIP01” on page 263. **This ends the procedure.**

3. Is the device you are attempting to repair a personal computer (PC)?

No: Continue with the next step.

Yes: PC emulation programs operate and report system-to-PC communications problems differently. See the PC emulation information for details on error identification. Then, continue with the next step.

4. Perform the following steps:

- a. Verify that all the devices you are attempting to repair, the primary console, and any alternative consoles are powered on.
- b. Verify that the all the devices you are attempting to repair, the primary console, and any alternative consoles have an available status. For more information on displaying the device status, see “Hardware Service Manager” on page 701.
- c. Verify that the workstation addresses of all workstations on the failing port are correct. Each workstation on the port must have a separate address, from 0 through 6. See the workstation service information for details on how to check addresses.
- d. Verify that the last workstation on the failing port is terminated. All other workstations on that port must not be terminated.
- e. Ensure that the cables that are attached to the device or devices are tight and are not visibly damaged.
- f. If there were any cable changes, check them carefully.
- g. If all of the workstations on the system are not working, disconnect them by terminating at the console.
- h. Verify the device operation (see the device information for instructions).
- i. The cursor position can assist in problem analysis.
 - If the cursor is in the upper right corner, it indicates a communication problem between the workstation IOP and the device. Continue with the next step.

- If the cursor is in the upper left corner, it indicates a communication problem between the workstation IOP and the operating system. Perform the following steps:
 - 1) Verify that all current PTFs are loaded.
 - 2) Ask your next level of support for assistance. **This ends the procedure.**
5. Is the system powered off?

Yes: Continue with the next step.

No: Go to step 8.
 6. Perform the following:
 - a. Power on the system in **Manual** mode. See “IPL type, mode, and speed options” on page 697 for details.
 - b. Wait for a display to appear on the console or a reference code to appear on the control panel.
Does a display appear on the console?
 - **No:** Continue with the next step.
 - **Yes:** If you disconnected any devices after the console in step 4 on page 256, perform the following:
 - a. Power off the system.
 - b. Reconnect one device.

Note: Ensure that you terminate the device you just reconnected and remove the termination from the device previously terminated.
 - c. Power on the system.
 - d. If a reference code appears on the control panel, go to step 9.
 - e. If no reference code appears, repeat steps a through d of this step until you have checked all devices disconnected previously.
 - f. Continue to perform the initial program load (IPL). **This ends the procedure.**
 7. Does the same reference code that sent you to this procedure appear on the control panel?

Yes: Continue with the next step.

No: Perform problem analysis for this new problem. **This ends the procedure.**
 8. Perform the following to make DST available:
 - a. Ensure that **Manual** mode on the control panel is selected.
 - b. Select function 21 **Make DST Available**.
 - c. Check the console and any alternative consoles for a display.
Does a display appear on any of the console displays?
 - **No:** Continue with the next step.
 - **Yes:** If you disconnected any devices after the console in step 4 on page 256, perform the following:
 - a. Power off the system.
 - b. Reconnect one device.

Note: Ensure that you terminate the device you just reconnected and remove the termination from the previously terminated device.
 - c. Power on the system.
 - d. If a reference code appears on the control panel or on the HMC, go to step 9.
 - e. If no reference code, repeat steps a through d of this step until you have checked all devices disconnected previously.
 - f. Continue to perform the initial program load (IPL). **This ends the procedure.**
 9. Ensure that the following conditions are met:

- The workstation addresses of all workstations on the failing port must be correct.
Each workstation on the port must have a separate address, from 0 through 6. See the workstation service information if you need help with checking addresses.

Did you find a problem with any of the above conditions?

Yes: Continue with the next step.

No: Go to step 11.

10. Perform the following:

- Correct the problem.
- Select function 21 **Make DST Available**.
- Check the console and any alternative consoles for a display.

Does a display appear on any of the consoles?

- **Yes:** Continue to perform the IPL. **This ends the procedure.**
- **No:** Does the same reference code appear on the control panel?

Yes: Continue with the next step.

No: Perform problem analysis for this new problem. **This ends the procedure.**

11. Is the reference code one of the following: 0001, 0003, 0004, 0005, 0006, 0101, 0103, 0104, 0105, 0106, 5004, 5082, B000, D010, or D023?

No: Continue with the next step.

Yes: Go to step 15 on page 259.

12. Does the system have an alternative console on a second workstation IOP?

Yes: Continue with the next step.

No: Go to step 14.

13. There is either a Licensed Internal Code problem, or there are two device failures on the workstation IOPs, consoles, or cables. The console and any alternative consoles are the most probable causes for this failure.

- See the service information for the failing display to attempt to correct the problem. If a display is connected to the system by a link protocol converter, use the link protocol converter information to attempt to correct the problem. The link protocol converter may be the failing item.
- If you have another working display, you can exchange the console and alternative consoles and perform an IPL to attempt to correct the problem.
- Exchange the following parts one at a time until you determine the failing item:
 - Console
 - Alternative console
 - Cables
 - Workstation IOA for the console
 - The multi-adapter bridge. **This ends the procedure.**

14. The console, cables, or the workstation IOP card is the most probable causes for this failure. If the console is connected to the system by a link protocol converter, the link protocol converter is possibly the failing item. Use one or more of the following options to correct the problem:

- See the service information for the failing displays for more information. If a display is connected to the system by a link protocol converter, see the link protocol converter information to attempt to correct the problem.
- If you have another working display, you can exchange the console and perform an IPL to attempt to correct the problem.
- Exchange the following parts one at a time until you determine the failing item:
 - 1) Console
 - 2) Workstation IOA

- 3) The multi-adapter bridge.
 - 4) Twinaxial attachment (cable) **This ends the procedure.**
15. To continue problem analysis, use a port tester, part 93X2040 or 59X4262, which you may have with your tools or the customer may have one. The port tester has either two or three lights.
- Is a port tester available?
- **Yes:** Continue with the next step.
 - **No:** Check or exchange the cables from the system to the failing display. Did this correct the problem?
 - Yes:** You corrected the problem. **This ends the procedure.**
 - No:** Go to step 12 on page 258.
16. To use the port tester to isolate the problem, perform the following:
- Verify that the port tester is operating correctly by doing a self-test. A self-test can be made at any time, even when the port tester is attached to a port or cable. Perform the following steps to do a self-test:
 - a. Move the selector switch to the center (0) position.
 - b. Push and hold the test button until all lights go on. The yellow lights should go on immediately, and the green light should go on approximately 5 seconds later. The port tester is ready for use if all lights go on.
 - Leave the system power on.
17. Find the input cable to the failing console or port.
- Is the failing console or the failing port attached to a protocol converter?
- **No:** Perform the following:
 - a. Disconnect the input cable from the failing console.
 - b. Connect the port tester to the input cable.
 - c. Continue with the next step.
 - **Yes:** Perform the following:
 - a. Disconnect the cable that comes from the system at the protocol converter.
 - b. Connect the port tester to the cable.
 - c. Continue with the next step.
18. Perform the following:
- a. Set the selector switch on the port tester to the left (1) position for a twinaxial connection. Set the switch to the right (2) position for a twisted pair connection.
 - b. Press and hold the test switch on the port tester for 15 seconds and observe the lights.
 - c. Choose from the following options:
 - If the port tester has **three** lights, do the following:
 - If only the top (green) light is on, go to step 27 on page 261.
 - If both the top (green) and center (yellow) lights are on, go to step 20 on page 260.
 - **Note:** The center (yellow) light is always on for twisted pair cable and may be on for fiber optical cable.
 - If only the bottom (yellow) light is on, go to step 21 on page 260.
 - If all lights are off, go to step 22 on page 260.
 - If all lights are on, go to step 19 on page 260.
 - If the port tester has **two** lights, do the following:
 - If only the top (green) light is on, go to step 27 on page 261.
 - If only the bottom (yellow) light is on, go to step 21 on page 260.
 - If both lights are off, go to step 22 on page 260.

- If both lights are on, continue with the next step.
19. The tester is in the self-test mode. Check the position of the selector switch.
 - If the selector switch is not in the correct position, go to step 18 on page 259.
 - If the selector switch is already in the correct position, the port tester is not working correctly. Exchange the port tester, and go to step 16 on page 259.
 20. The cable you are testing has an open shield.

Note: The open shield can be checked only on the cable from the twinaxial workstation attachment to the device or from device to device. Only one section of cable can be checked at a time. See the SA41-3136, Port Tester Use information.

This ends the procedure.
 21. The cable network is bad. The wires in the cable between the console and the twinaxial workstation attachment are reversed. Go to step 26.
 22. Perform the following:
 - a. Find the twinaxial workstation attachment to which the failing console is attached.
 - b. Disconnect the cable from port 0 on that twinaxial workstation attachment.
 - c. Connect the port tester to port 0 on the attachment.
 - d. Set the selector switch on the port tester to the left (1) position.
 23. Perform the following:
 - a. Press and hold the test switch on the port tester for 15 seconds and observe the lights.
 - b. If the port tester has **three** lights, do the following:
 - If both the top (green) and center (yellow) lights are on, continue with step 24.

Note: The center (yellow) light is always on for twisted pair cable and may be on for fiber optical cable.

 - If only the bottom (yellow) light is on, continue with step 24.
 - If all lights are off, continue with step 24.
 - If only the top (green) light is on, go to step 26.
 - If all lights are on, go to step 25.
 - c. If the port tester has **two** lights, do the following:
 - If only the top (green) light is on, go to step 26.
 - If only the bottom (yellow) light is on, continue with step 24.
 - If both lights are off, continue with step 24.
 - If both lights are on, go to step 25.
 24. The test indicated that there was no signal from the system. Reconnect the cable you disconnected and perform the following:
 - a. Exchange the following parts:
 - 1) Twinaxial workstation IOA card
 - 2) The multi-adapter bridge.
 - b. Power on the system to perform an IPL. **This ends the procedure.**
 25. The tester is in the self-test mode. Check the position of the selector switch:
 - If the selector switch is not in the left (1) position, set the switch to the left (1) position. Then go to step 23.
 - If the selector switch is already in the left (1) position, the port tester is not working correctly. Exchange the port tester and go to step 22.
 26. The cable to the workstation is the failing item. Cable maintenance is a customer responsibility. The cable must be repaired or exchanged. Then, power on the system to perform an IPL. **This ends the procedure.**

27. The port tester detects most problems, but it does not always detect an intermittent problem or some cable impedance problems. The tester may indicate a good condition, although there is a problem with the workstation IOP card or cables.
- a. If the failing display is connected to a link protocol converter, the link protocol converter is the failing item. See the link protocol converter service information to correct the problem.
 - b. Exchange the following parts:
 - 1) Console
 - 2) Twinaxial workstation IOA
 - 3) The multi-adapter bridge.
 - 4) Cables
 - c. If you have another working display, you can exchange the console and perform an IPL to attempt to correct the problem. See the service information for the failing display for more information.
 - d. If exchanging the failing items did not correct the problem and the reference code was a 5002, 5082, or 50FF, there may be a Licensed Internal Code problem. Go to "LICIP03" on page 105.
 - e. The problem may be caused by devices that are attached after the console on port 0. **This ends the procedure.**

Workstation adapter isolation procedure

Contains the procedure necessary to isolate a failure that is detected by the workstation adapter, and is used when no display is available with which to perform on-line problem analysis.

The workstation adapter detected a problem while communicating with the workstation that is used as the primary console.

Note: If you are using a PC, you must install an emulation program.

Please read and observe all safety procedures before servicing the system and while performing the procedure below.

Attention: Unless instructed otherwise, always power off the system or expansion tower where the FRU is located (see "Powering on and powering off" on page 641) before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

"WSAIP01" on page 263

Use this procedure if your console has a keyboard error with a "K" on the display.

WSAIP01

Use this procedure if your console has a keyboard error with a "K" on the display.

Note: If the console has a keyboard error, there may be a "K" on the display. See the workstation service information for more information.

Perform the following procedure from the logical partition that reported the problem:

1. Select the icon on the workstation to make it the console (you may have already done this). You must save the console selection.
2. Access Dedicated Service Tools (DST) by performing the following:
 - a. Select **Manual** mode on the control panel.
 - b. Use the selection switch on the control panel to display function 21, **Make DST Available**, and press **Enter** on the control panel.
 - c. Wait for a display to appear on the console or for a reference code to appear on the control panel.

Does a display appear on the console?

No: Continue with the next step.

Yes: The problem is corrected. **This ends the procedure.**

3. Isolate the problem to one server and one workstation (console) by performing the following:
 - a. Disconnect the power cable from the workstation.
 - b. Eliminate all workstations, cables, and connector boxes from the network except for one server, one console, two connector boxes, and one cable.
 - c. Ensure that the cables that are connected to the console, the keyboard, and the server are connected correctly and are not damaged.
4. Perform the following:
 - a. Ensure that the server console is terminated correctly.
 - b. Set the Power switch on the console to the **On** position.
 - c. Select the **SNA*PS** icon on the console.
 - d. See the workstation information for more information.
5. Access DST by performing the following:
 - a. Select **Manual** mode on the control panel.
 - b. Use the selection switch on the control panel to display function 21, **Make DST Available**, and press **Enter** on the control panel.
 - c. Wait for a display to appear on the console or for a reference code to appear on the control panel.

Does a display appear on the console?

No: Continue with the next step.

Yes: The problem is in a cable, connector box, or device you disconnected in step 3. **This ends the procedure.**

6. Does the reference code A600 5005 appear on the control panel?

Yes: Continue with the next step.

No: Perform problem analysis using this reference code. **This ends the procedure.**
7. Do you have another workstation, cable, and two connector boxes you can exchange with the workstation connected to the server?
 - **Yes:** Continue with the next step.
 - **No:** One of the following is causing the problem:

Note: The items at the top of the list have a higher probability of fixing the problem than the items at the bottom of the list.

– Workstation adapter Licensed Internal Code

- Workstation adapter configuration
- Workstation
- Cable
- Connector box
- Workstation IOA
- Workstation IOP

If you still have not corrected the problem, ask your next level of support for assistance. **This ends the procedure.**

8. Repeat steps 3 on page 263 through 7 on page 263 of this procedure, using a different workstation, cable, and connector boxes.

Do you still have a problem?

Yes: Continue with the next step.

No: The problem is in the cable, connector boxes, or workstation you disconnected. **This ends the procedure.**

9. One of the following is causing the problem:

Note: The items at the top of the list have a higher probability of fixing the problem than the items at the bottom of the list.

- Workstation adapter Licensed Internal Code
- Workstation adapter configuration
- Workstation IOA
- Communications IOP

To bring up a workstation other than the console, perform the following:

- a. Connect another workstation into this network.
- b. Select **Normal** mode on the control panel.
- c. Perform an IPL.

If the sign-on display appears, the following parts are good:

- Communications IOP
- Workstation IOA

Note: If a printer connected to this assembly is not working correctly, it may look like the display is bad. Perform a self-test on the printer to ensure that it prints correctly (see the printer service information).

If you still have not corrected the problem, ask your next level of support for assistance. **This ends the procedure.**

Workstation adapter console isolation procedure

Contains the procedure necessary to isolate a failure that is detected by the workstation adapter console.

Use this procedure when no display is available with which to perform online problem analysis.

Note: If you are using a PC, you must install an emulation program.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion tower where the FRU is located, see “Powering on and powering off” on page 641 before removing, exchanging, or installing a field-replaceable unit (FRU).

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

Read and understand the following service procedures before using this section:

- “Powering on and powering off” on page 641
- “Determining a primary or alternative console” on page 644
- Chapter 3, “Locating FRUs,” on page 347

Note: If the console has a keyboard error, there may be a K on the display. See the workstation service information for more information.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to “Determining if the system has logical partitions” on page 646.
2. Ensure that your workstation meets the following conditions:
 - The workstation that you are using for the console is powered on.
 - The emulation program is installed and is working.
 - The input/output adapter (IOA) is installed and the workstation console cable is attached.

Notes:

- a. Card information: Hardware that is associated with 6A59 feature is the type 2745 card.
- b. Cable information: The cable attaches directly to the IOA.

Did you find a problem with any of the conditions listed above?

No: Continue with the next step.

Yes: Correct the problem. Then, perform an IPL of the system. **This ends the procedure.**

3. Perform the following to make dedicated service tool (DST) available:
 - a. If there is an alternative console, ensure that it is powered on.
 - b. Ensure that **Manual** mode on the control panel is selected.
 - c. Select function 21, **Make DST Available** on the control panel, and press **Enter**.

Does a display appear on either the console or any alternative console?

No: Continue with the next step.

Yes: Complete the IPL. When the operating system display appears, use the Work with Problem command (WRKPRB) or Analyze Problem command (ANZPRB) to analyze and correct or report any console problems. **This ends the procedure.**

4. Do you have SRC A600 5001, A600 5004, A600 5007, or B075 xxxx (where xxxx is any value)?
 - **No:** Continue with the next step.
 - **Yes:** Perform the following:
 - a. Disconnect any cables that are attached to the IOA.
 - b. Install the wrap plug on the IOA. The 2745 wrap plug label is QQ.
 - c. Perform an IPL in Manual mode.

5. Does SRC 6A59 5007 occur?

- **No:** Continue with the next step.
- **Yes:** One of the following is causing the problem:
 - Workstation emulation program
 - Workstation
 - Workstation console cable

This ends the procedure.

6. Did SRC A600 5001, A600 5004, or 6A59 5008 occur?

No: This is a new problem. Use the new reference code to perform problem analysis for the problem, or ask your next level of support for assistance. **This ends the procedure.**

Yes: The Type 2745 workstation adapter is the failing item. **This ends the procedure.**

Isolating problems on servers that run the AIX or Linux operating systems

Use the procedures for AIX or Linux servers if there is not an HMC attached to the server. If the server is connected to an HMC, use the procedures that are available on the HMC to continue FRU isolation.

“General problem resolution” on page 268

Use this procedure to exchange the FRUs in the order of their failure probability.

“Problems with loading and starting the operating system (AIX and Linux)” on page 268

If the system is running partitions from partition standby (LPAR), the following procedure addresses the problem in which one partition will not boot AIX or Linux while other partitions boot successfully and run the operating system successfully.

“Storage I/O card modes and jumpers” on page 272

“SCSI service hints” on page 274

Use one or more of the following procedures when servicing SCSI adapter or devices.

“Hot-Swap FRU problem resolution” on page 281

Use this procedure to exchange hot-swappable field replaceable units (FRUs).

“MAP 0020: Problem determination procedure” on page 285

Use this MAP to get a service request number (SRN) if the customer or a previous MAP provided none.

“MAP 0030: Additional Problem Determination” on page 292

This MAP is used for problems that still occur after all FRUs indicated by the SRN or error code have been exchanged.

“MAP 0040: Intermittent Problem Isolation” on page 293

This MAP provides a structured way of analyzing intermittent problems.

“MAP 0050: SCSI bus problems” on page 295

Use this MAP to analyze problems with a SCSI bus.

“MAP 0054: PCI-X SCSI Bus Problems” on page 302

Use this MAP to determine which FRUs may need to be replaced in order to solve a SCSI bus-related problem on a PCI-X SCSI or PCI-X SCSI RAID adapter.

“MAP 0070: 888 sequence in operator panel display” on page 304

Use this MAP when you receive an 888 sequence on the operator panel display or monitor.

“MAP 0230: Platform error problem resolution” on page 305

Use this MAP to resolve problems reported by SRNs A00-xxx to A25-xxxx.

“MAP 0260: System hangs during resource configuration” on page 310

Use this MAP when the system unit hangs while configuring a resource.

“MAP 0270: SCSI RAID problem resolution and verification” on page 312

Use this MAP to resolve SCSI RAID adapter, cache, or drive problems.

“MAP 0280: Console and Keyboard Problem Resolution” on page 317

Use this MAP to resolve console and keyboard problems when the system is booting.

“MAP 0285: Multipath I/O (MPIO) Problem Resolution” on page 317

Use this MAP to handle SRN A23-001 and ssss-640 (where ssss is the 3 or 4 digit Failing Function Code (FFC) of an SCSD drive) to check the path from adapter to device.

“MAP 0291: Missing Device or Bus Problem Resolution” on page 321

Use this MAP when a bus or device (such as a disk drive) is reported as a missing resource by the diagnostics.

“PFW1540: Problem isolation procedures” on page 322

The PFW1540 procedures are used to locate problems in the processor subsystem or I/O subsystem(s).

“PFW1542: I/O problem isolation procedure” on page 323

This I/O problem-determination procedure isolates I/O card and I/O subsystem failures. When I/O problem isolation is complete, all cables and cards that are failing will have been replaced or reseated.

“PFW1548: Memory and processor subsystem problem isolation procedure” on page 336
Use this problem isolation procedure to aid in solving memory and processor problems that are not found by normal diagnostics.

General problem resolution

Use this procedure to exchange the FRUs in the order of their failure probability.

- **Step 0210-1**

Did the problem report provide a part number for the FRU you are about to replace?

NO Go to Step 0210-2.

YES Go to Step 0210-3.

- **Step 0210-2**

Find the failing function codes in the Chapter 8, “Part Information,” on page 741, and record the FRU part number and description of each FRU.

- **Step 0210-3**

Obtain the replacement part.

- **Step 0210-4**

Go to Chapter 3, “Locating FRUs,” on page 347, and follow the procedures for the FRU you are servicing.

Problems with loading and starting the operating system (AIX and Linux)

If the system is running partitions from partition standby (LPAR), the following procedure addresses the problem in which one partition will not boot AIX or Linux while other partitions boot successfully and run the operating system successfully.

It is the customer’s responsibility to move devices between partitions. If a device must be moved to another partition to run standalone diagnostics, contact the customer or system administrator. (If the optical drive must be moved to another partition, all SCSI devices connected to that SCSI adapter must be moved because moves are done at the slot level, not at the device level.)

Depending on the boot device, a checkpoint may be displayed on the operator panel for an extended period of time while the boot image is retrieved from the device. This is particularly true for tape and network boot attempts. If booting from an optical drive or tape drive, watch for activity on the drive’s LED indicator. A blinking LED indicates that the loading of either the boot image or additional information required by the operating system being booted is still in progress. If the checkpoint is displayed for an extended period of time and the drive LED is not indicating any activity, there might be a problem loading the boot image from the device.

Notes:

1. For network boot attempts, if the system is not connected to an active network or if the target server is inaccessible (which can also result from incorrect IP parameters being supplied), the system will still attempt to boot. Because time-out durations are necessarily long to accommodate retries, the system may appear to be hung. Refer to checkpoint CA00 E174.
2. If the partition hangs with a 4-character checkpoint in the display, the partition must be deactivated, then reactivated before attempting to reboot.
3. If a BA06 000x error code (or a 20EE xxxx error code on a 7037-A50 or a 7047-185) is reported, the partition is already deactivated and in the error state. Reboot by activating the partition. If the reboot is still not successful, go to step 3 on page 269.

This procedure assumes that a diagnostic CD-ROM and an optical drive from which it can be booted are available, or that diagnostics can be run from a NIM (network installation management) server. Booting the diagnostic image from an optical drive or a NIM server is referred to as running standalone diagnostics.

1. Is a Hardware Management Console attached to the managed system?

Yes: Continue with the next step.

No: Go to step 3.

2. Look at the service action event error log in **Manage Serviceable Events** on the HMC. Perform the actions necessary to resolve any open entries that affect devices in the boot path of the partition or that indicate problems with I/O cabling. Then try to reboot the partition. Does the partition reboot successfully?

Yes: This ends the procedure.

No: Continue with the next step.

3. Boot to the SMS main menu:

- If you are rebooting a partition from partition standby (LPAR), go to the properties of the partition and select **Boot to SMS**, then activate the partition.
- If you are rebooting from platform standby, access the ASMI (see “Accessing the ASMI using a Web browser” on page 702). Select **Power/Restart Control**, then **Power On/Off System**. In the AIX/Linux partition mode boot box, select **Boot to SMS menu** → **Save Settings and Power On**.

At the SMS main menu, select **Select Boot Options** and check to see if the intended boot device is correctly specified in the boot list. Is the intended load device correctly specified in the boot list?

- **Yes:** Perform the following:

- a. Remove all removable media from devices in the boot list from which you do not want to load the operating system.
- b. If you are attempting to load the operating system from a network, go to step 4.
- c. If you are attempting to load the operating system from a disk drive or an optical drive, go to step 7 on page 270.
- d. **No:** Go to step 5.

4. If you are attempting to load the operating system from the network, perform the following:

- Verify that the IP parameters are correct.
- Use the SMS ping utility to attempt to ping the target server. If the ping is not successful, have the network administrator verify the server configuration for this client.
- Check with the network administrator to ensure that the network is up. Also ask the network administrator to verify the settings on the server from which you are trying to load the operating system.
- Check the network cabling to the adapter.

Restart the partition and try loading the operating system. Does the operating system load successfully?

Yes: This ends the procedure.

No: Go to step 7 on page 270.

5. Use the SMS menus to add the intended boot device to the boot sequence. Can you add the device to the boot sequence?

Yes: Restart the partition. **This ends the procedure.**

No: Continue with the next step.

6. Ask the customer or system administrator to verify that the device you are trying to load from is assigned to the correct partition. Then select **List All Devices** and record the list of bootable devices that displays. Is the device from which you want to load the operating system in the list?

Yes: Go to step 7 on page 270.

No: Go to step 10 on page 270.

7. Try to load and run standalone diagnostics against the devices in the partition, particularly against the boot device from which you want to load the operating system. You can run standalone diagnostics from an optical drive or a NIM server. To boot standalone diagnostics, follow the detailed procedures in "Running the online and eServer stand-alone diagnostics" on page 729.

Note: When attempting to load diagnostics on a partition from partition standby, the device from which you are loading standalone diagnostics must be made available to the partition that is not able to load the operating system, if it is not already in that partition. Contact the customer or system administrator if a device must be moved between partitions in order to load standalone diagnostics.

Did standalone diagnostics load and start successfully?

Yes: Go to step 8.

No: Go to step 14 on page 271.

8. Was the intended boot device present in the output of the Display Configuration and Resource List option (which is run from the Task Selection menu)?
 - **Yes:** Continue with the next step.
 - **No:** Go to step 10.
9. Did running diagnostics against the intended boot device result in a "No Trouble Found" message?

Yes: Go to step 12 on page 271.

No: Go to the list of service request numbers and perform the repair actions for the SRN reported by the diagnostics. When you have completed the repair actions, go to step 13 on page 271.
10. Perform the following actions:
 - a. Perform the first item in the action list below. In the list of actions below, choose SCSI or IDE based on the type of device from which you are trying to boot the operating system.
 - b. Restart the system or partition.
 - c. Stop at the SMS menus and select **Select Boot Options**.
 - d. Is the device that was not appearing previously in the boot list now present?

Yes: Go to Chapter 5, "Verifying a repair," on page 611. **This ends the procedure.**

No: Perform the next item in the action list and then return to step 10b. If there are no more items in the action list, go to step 11 on page 271.

Action list:

Note: See Chapter 3, "Locating FRUs," on page 347 for part numbers and links to exchange procedures.

- a. Verify that the SCSI or IDE cables are properly connected. Also verify that the device configuration and address jumpers are set correctly.
- b. Do one of the following:
 - **SCSI boot device:** If you are attempting to boot from a SCSI device, remove all hot-swap disk drives (except the intended boot device, if the boot device is a hot-swap drive). If the boot device is present in the boot list after you boot the system to the SMS menus, add the hot-swap disk drives back in one at a time, until you isolate the failing device.
 - **IDE boot device:** If you are attempting to boot from an IDE device, disconnect all other internal SCSI or IDE devices. If the boot device is present in the boot list after you boot the system to the SMS menus, reconnect the internal SCSI or IDE devices one at a time, until you isolate the failing device or cable.
- c. Replace the SCSI or IDE cables.
- d. Replace the SCSI backplane (or IDE backplane, if present) to which the boot device is connected.
- e. Replace the intended boot device.
- f. Replace the system backplane.

11. Choose from the following:
 - If the intended boot device is not listed, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 336. **This ends the procedure.**
 - If an SRN is reported by the diagnostics, go to the list of service request numbers and follow the action listed. **This ends the procedure.**
12. Have you disconnected any other devices?

Yes: Reinstall each device that you disconnected, one at a time. After you reinstall each device, reboot the system. Continue this procedure until you isolate the failing device. Replace the failing device, then go to step 13.

No: Perform an operating system-specific recovery process or reinstall the operating system. **This ends the procedure.**
13. Is the problem corrected?

Yes: Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**

No: If replacing the indicated FRUs did not correct the problem, or if the previous steps did not address your situation, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 336. **This ends the procedure.**
14. Is a SCSI boot failure (where you cannot boot from a SCSI-attached device) also occurring?
 - **Yes:** Go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 336. **This ends the procedure.**
 - **No:** Continue to the next step.
15. Perform the following actions to determine if another adapter is causing the problem:
 - a. Remove all adapters except the one to which the optical drive is attached and the one used for the console.
 - b. Reload the standalone diagnostics. Can you successfully reload the standalone diagnostics?
 - **Yes:** Perform the following:
 - 1) Reinstall the adapters that you removed (and attach devices as applicable) one at a time. After you reinstall each adapter, retry the boot operation until the problem reoccurs.
 - 2) Replace the adapter or device that caused the problem.
 - 3) Go to Chapter 5, “Verifying a repair,” on page 611. **This ends the procedure.**
 - **No:** Continue with the next step.
16. The graphics adapter (if installed), optical drive, IDE or SCSI cable, or system board is most likely defective. Does your system have a PCI graphics adapter installed?

Yes: Continue with the next step.

No: Go to step 18
17. Perform the following to determine if the graphics adapter is causing the problem:
 - a. Remove the graphics adapter.
 - b. Attach a TTY terminal to the system port.
 - c. Try to reload standalone diagnostics. Do the standalone diagnostics load successfully?

Yes: Replace the graphics adapter. **This ends the procedure.**

No: Continue with the next step.
18. Replace the following (if not already replaced), one at a time, until the problem is resolved:
 - a. Optical drive
 - b. IDE or SCSI cable that goes to the optical drive
 - c. System board that contains the integrated SCSI or IDE adapters.

If this resolves the problem, go to Chapter 5, “Verifying a repair,” on page 611. If the problem still persists or if the previous descriptions did not address your particular situation, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 336.

This ends the procedure.

Storage I/O card modes and jumpers

The 2748 and 2778 I/O cards can run in either compression mode or enhanced mode.

- **Compression Mode:** Compression mode should only be used when you want to run Integrated Hardware Disk Compression. In compression mode, the write cache size is 4 MB.
- **Enhanced Mode:** Enhanced mode has an enhanced write cache size. In enhanced mode, the write cache size for the 2748 I/O card is 26MB, and the maximum compressed write cache size for the 2778 I/O card is 104MB. Enhanced mode also provides support for Extended Adaptive Cache (by attachment of a read cache device) and Extended Adaptive Cache Simulator.

The following subtopics are included here:

- “Setting or changing the mode of an I/O card.”
- When an error regarding the mode of the storage I/O card appears, the error message indicates whether the jumper is missing or overridden.
 - If the error message is CPPEA20, the I/O card has overridden the mode set by the jumper. See “Mode jumper has been overridden” on page 273.
 - If the error message is CPPEA21, the I/O card has detected that the jumper is missing. See “Mode jumper is missing” on page 274.

“Setting or changing the mode of an I/O card”

Provides detailed steps for setting or changing the mode of an I/O card.

“Mode jumper has been overridden” on page 273

Covers how to correct the error message that appears when the mode jumper has been overridden.

“Mode jumper is missing” on page 274

The error message CPPEA21 appears when the mode jumper is missing from the storage I/O card.

Setting or changing the mode of an I/O card

Provides detailed steps for setting or changing the mode of an I/O card.

How to set or change the mode of an I/O card:

The 2748 and 2778 I/O cards support two modes: compression and enhanced. The rear of the I/O card is marked with a **C**, indicating compression mode, and an **E**, indicating enhanced mode. Three pins on the rear of the I/O card determine the mode of the card, depending on which of the pins have a jumper placed on them.

The jumper may be moved at any time, but changes only take effect during a system IPL. Refer to the illustration below while changing the mode jumper.

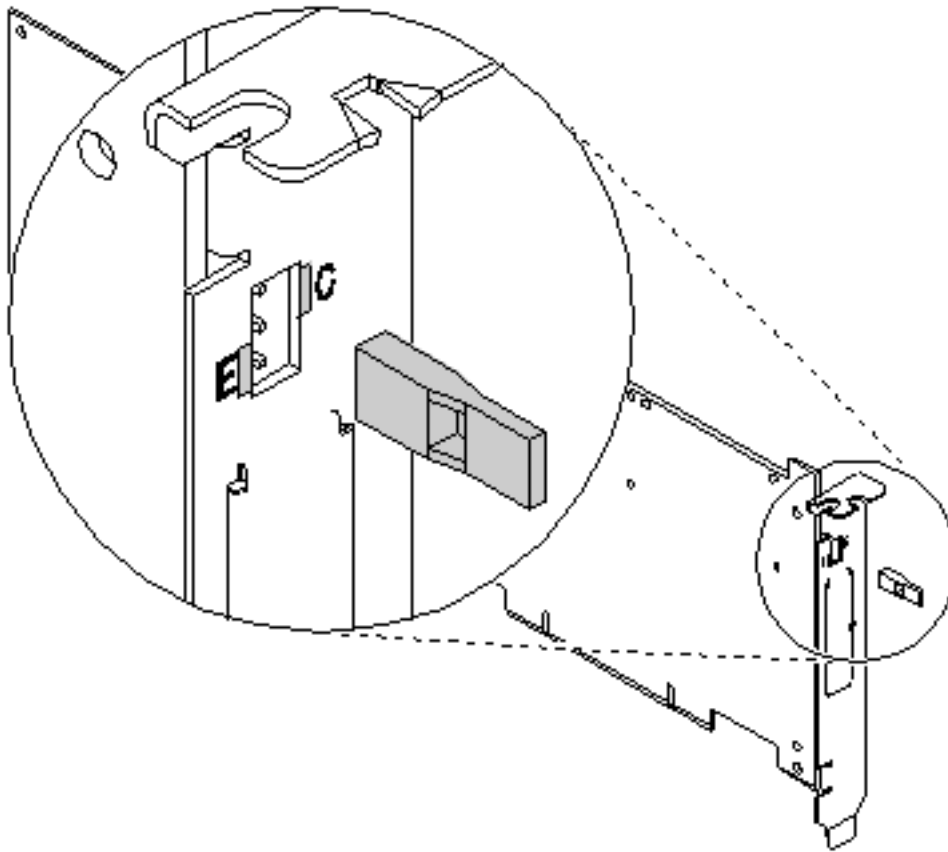


Figure 3. Changing the mode jumper

1. Power off the system, ensuring that no jobs are currently processing (see “Powering on and powering off” on page 641).
2. Choose from the following options:
 - To set the mode of the card to compressed (**C**), place the jumper on the top and middle pins.
 - To set the mode of the card to enhanced (**E**), place the jumper on the middle and bottom pins.
3. Select the IPL type and mode.
4. Power on the system.

Mode jumper has been overridden

Covers how to correct the error message that appears when the mode jumper has been overridden.

The error message CPPEA20 appears when the mode jumper has been overridden. This is due to cache data that is in a conflicting mode.

1. To begin correcting this error, examine the mode jumpers in the rear section of the storage I/O card.

Note: The mode jumper is accessible without requiring the removal of the I/O card.

2. Choose from the following options:
 - If the mode jumper is not in the desired position, follow the steps in “Setting or changing the mode of an I/O card” on page 272.
 - If the mode jumper is in the desired position and any other I/O card or device reference codes occurred at about the same time as this error, contact your service representative.

- If the mode jumper is in the desired position and no other I/O card or device reference codes occurred at about the same time as this error, then power the system down normally and IPL. See “Powering on and powering off” on page 641. **This ends the procedure.**

Mode jumper is missing

The error message CPPEA21 appears when the mode jumper is missing from the storage I/O card.

1. Locate the jumper.
2. Power off the system. See “Powering on and powering off” on page 641.
3. Install the jumper in the correct position. See “Setting or changing the mode of an I/O card” on page 272.
4. Power on the system. **This ends the procedure.**

SCSI service hints

Use one or more of the following procedures when servicing SCSI adapter or devices.

General SCSI Configuration Checks

The following steps apply to all types of SCSI problems:

1. Verify that all SCSI devices on the SCSI bus have a unique address.
2. Verify that all cables are connected securely and that there is proper termination at both ends of the SCSI bus.
3. Verify that the cabling configuration does not exceed the maximum cable length for the adapter in use.
4. Verify that the adapters and devices that you are working with are at the appropriate microcode levels for the customer situation. If you need assistance with microcode issues, contact your service support structure.
5. If there are multiple SCSI adapters on the SCSI bus, verify that the customer is using the appropriate software (such as HACMP™ or HANFS) to support such an arrangement. If the correct software is not in use, some SCSI errors should be expected when multiple adapters attempt to access the same SCSI device. Also, each adapter should have a unique address.

High Availability or Multiple SCSI System Checks

If you have a high-availability configuration, or if more than one system is attached to the same SCSI bus, do the following:

1. Verify that the adapters and devices have unique SCSI addresses. The default SCSI adapter address is always 7. If you have more than one adapter on the bus, change the address of at least one adapter. This can be done by using SMIT (**SMIT Devices → SCSI Adapter → Change/Show characteristics of an adapter**). You must make the changes to the database only, then reboot the system in order for the change to take effect.

Note: Diagnostics defaults to using ID 7 (it is recommended that this ID not be used in high availability configurations).

2. If RAID devices such as the 7135 or 7137 are attached, be sure to run the proper diagnostics for the device. If problems occur, contact your service support structure for assistance. If the diagnostics are run incorrectly on these devices, misleading SRNs can result.
3. Diagnostics cannot be run against OEM devices; doing so results in misleading SRNs.
4. Verify that all cables are connected securely and that both ends of the SCSI bus is terminated correctly.
5. Verify that the cabling configuration does not exceed the maximum cable length for the adapter in use. Refer to the SCSI Cabling section in the *RS/6000® eServer™ pSeries® Adapters, Devices, and Cable Information for Multiple Bus Systems* for more details on SCSI cabling issues.
6. Verify that adapter and devices are at the appropriate microcode levels for the customer situation. If you need assistance with microcode issues, contact your service support structure.

SCSI-2 Single-Ended Adapter PTC Failure Isolation Procedure

Before replacing a SCSI-2 single-ended adapter, use these procedures to determine if a short-circuit condition exists on the SCSI bus. The same positive temperature coefficient (PTC) resistor is used for both the internal and external buses. The PTC protects the SCSI bus from high currents due to shorts on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. Unless instructed to do so by these procedures, do not replace the adapter because of a tripped PTC resistor.

A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off. Wait 5 minutes for the PTC resistor to fully cool, then retest.

These procedures determine if the PTC resistor is still tripped and then determine if there is a short somewhere on the SCSI bus.

Determining Where to Start

Use the following to determine the adapter configuration and select the proper procedure:

- If there are external cables attached to the adapter, start with the "External Bus PTC Isolation Procedure" for your type adapter. The procedures are found in this chapter.
- If there are no external cables attached, start with the "Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure" on page 276.
- If there is a combination of external and internal cables start with the "External Bus PTC Isolation Procedure" for your type adapter. The procedures are found in this chapter. If this procedure does not resolve the problem, continue with the "Internal Bus PTC Isolation Procedure" for your type adapter. The procedures are found in this chapter.

External SCSI-2 Single-Ended Bus PTC Isolation Procedure

Isolate the external SCSI bus PTC fault with the following procedure:

Note: The external bus is of single-ended design.

1. Ensure the system power and all externally attached device power is turned off. All testing is accomplished with the power off.
2. Disconnect any internal and external cables from the adapter and remove the adapter from the system.
3. Verify with a digital Ohmmeter that the internal PTC resistor, labeled Z1, (refer to the illustration after Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure, step 3 on page 276) is cool and in a low resistance state, typically less than 1/2 Ohm. Measuring across, be sure to probe both sides of the PTC where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC resistor to cool and measure again.
4. This step determines if there is a short on the adapter. Locate Capacitor C1 and measure the resistance across it by using the following procedure:
 - a. Connect the positive lead to the side of the capacitor where the + is indicated on the board near C1. Be sure to probe at the solder joint where the capacitor and board come together.
 - b. Connect the negative lead to the opposite side of the capacitor marked "GND." Be sure to probe at the solder joint where the capacitor and board come together.
 - c. If there is no short present, then the resistance reading is high, typically hundreds of Ohms.

Note: Because this is a measurement across unpowered silicon devices, the reading is a function of the Ohmmeter used.

- If there is a fault, the resistance reading is low, typically below 10 Ohms. Because there are no cables attached, the fault is on the adapter. Replace the adapter.

Note: Some multi-function meters label the leads specifically for voltage measurements. When using this type of meter to measure resistance, the plus lead and negative lead may not be labeled correctly. If you are not sure that your meter leads accurately reflect the polarity for measuring resistance, repeat this step with the leads reversed. If the short circuit is not indicated with the leads reversed, the SCSI bus is not faulted (shorted).

- If the resistance measured was high, proceed to the next step.
5. Reattach the external cable to the adapter, then do the following:
 - a. Measure across C1 as previously described.
 - b. If the resistance is still high, in this case above 10 Ohms, then there is no apparent cause for a PTC failure from this bus. If there are internal cables attached continue to the "Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure."
 - c. If the resistance is less than 10 Ohms, there is a possibility of a fault on the external SCSI bus. Troubleshoot the external SCSI bus by disconnecting devices and terminators. Measure across C1 to determine if the fault has been removed. Replace the failing component. Go to Chapter 5, "Verifying a repair," on page 611.

External SCSI-2 Single-Ended Bus Probable Tripped PTC Causes

The following list provides some suggestions of things to check when the PTC is tripped:

- A shorted terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by improperly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- Plugging or unplugging a cable or terminator while the system is turned on (hot plugging).
- A shorted device.
- Differential devices or terminators are attached to the single-ended SCSI bus.

Note: The SCSI-2 Fast/Wide and Ultra PCI Adapters use an onboard electronic terminator on the external SCSI bus. When power is removed from the adapter, as in the case of this procedure, the terminator goes to a high impedance state and the resistance measured cannot be verified, other than it is high. Some external terminators use an electronic terminator, which also goes to a high impedance state when power is removed. Therefore, this procedure is designed to find a short or low resistance fault as opposed to the presence of a terminator or a missing terminator.

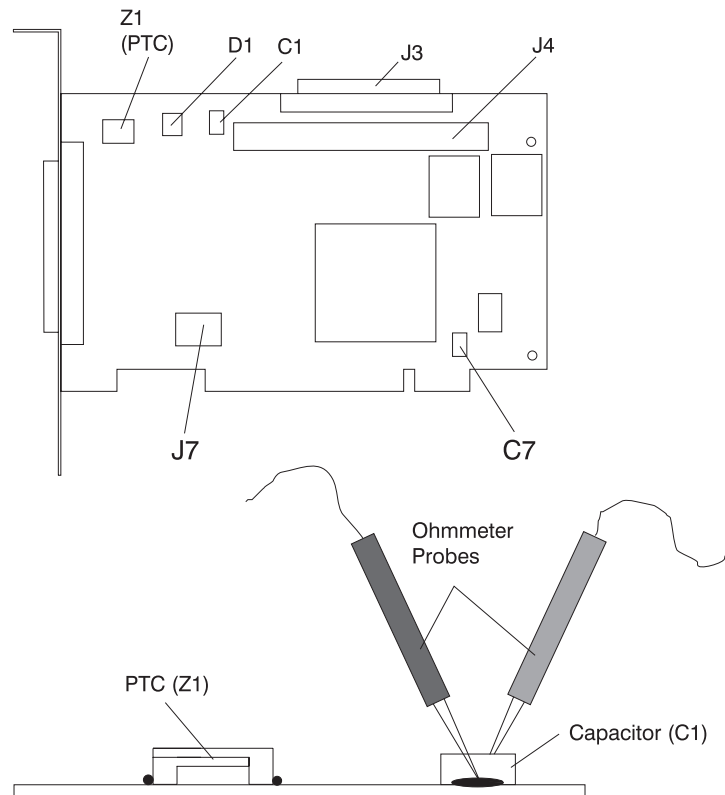
Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure

Isolate the internal SCSI bus PTC resistor fault with the following procedure:

Note: The internal bus is single-ended.

1. Ensure that system power and all externally attached device power is turned off.
2. Disconnect any internal and external cables from the adapter then remove the adapter from the system.
3. Verify with a digital Ohmmeter, that the internal PTC resistor, labeled Z1, is cool and in a low resistance state, typically less than 1/2 Ohm. Measuring across, be sure to probe both sides of the PTC where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC to cool and measure again. Refer to the following illustration.

SCSI-2 Fast/Wide PCI Single-Ended Adapter



Note: Only the probe tips are touching the solder joints. Do not allow the probes to touch any other part of the component.

4. This step determines if there is a short on the adapter. Locate capacitor C1 and measure the resistance across it using the following procedure:
 - a. Connect the positive lead to the side of the capacitor where the + is indicated. Be sure to probe at the solder joint where the capacitor and board come together.
 - b. Connect the negative lead to the opposite side of the capacitor. Be sure to probe at the solder joint where the capacitor and board come together.
 - c. If there is no short present, the resistance reading is high, typically hundreds of Ohms.

Note: Because this is a measurement across unpowered silicon devices, the reading is a function of the Ohmmeter used.

- If there is a fault, the resistance reading is low, typically below 10 Ohms. Because there are no cables attached, the fault is on the adapter. Replace the adapter.

Note: Some multi-function meters label the leads specifically for voltage measurements. When using this type of meter to measure resistance, the plus lead and negative lead may not be labeled correctly. If you are not sure that your meter leads accurately reflect the polarity for measuring resistance, repeat this step with the leads reversed. Polarity is important in this measurement to prevent forward-biasing diodes which lead to a false low resistance reading. If the short circuit is not indicated with the leads reversed, the SCSI bus is not faulted (shorted).

- If the resistance is high and there is no internal cable to reattach, there is no apparent cause for the PTC resistor diagnostic failure.
 - If the resistance is high and there is an internal cable to reattach, proceed to the next step.
5. Reattach the internal cable to the adapter, then do the following:

- a. Measure across C1 as described above.
- b. If the resistance is still high, above 25 Ohms, there is no apparent cause for a PTC failure.
- c. If the resistance is less than 10 Ohms, a fault on the internal SCSI bus is possible. Troubleshoot the internal SCSI bus by disconnecting devices and terminators. Measure across C1 to determine if the fault has been removed.

Note: Some internal cables have nonremovable terminators.

Internal SCSI-2 Single-Ended Bus Probable Tripped PTC Resistor Causes

The following list provides some suggestions of things to check when the PTC is tripped:

- A shorted terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by incorrectly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- A shorted device.
- On some systems, the terminator is fixed to the internal cable and cannot be removed. If all devices are removed from the cable and the resistance is still low, then the cable should be replaced.

Note: The SCSI-2 Fast/Wide and Ultra PCI adapters use an onboard electronic terminator on the internal SCSI bus. When power is removed from the adapter, as in the case of this procedure, the terminator goes to a high impedance state and the resistance measured cannot be verified, other than it is high. Some internal terminators use an electronic terminator, which also goes to a high impedance state when power is removed. Therefore, this procedure is designed to find a short or low resistance fault as opposed to the presence of a terminator or a missing terminator.

SCSI-2 Differential Adapter PTC Failure Isolation Procedure

Use this procedure when SRN xxx-240 or xxx-800 has been indicated.

The differential adapter can be identified by the 4-B or 4-L on the external bracket plate.

Before replacing a SCSI-2 differential adapter, use these procedures to determine if a short-circuit condition exists on the SCSI Bus. The PTC protects the SCSI bus from high currents due to shorts on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. Unless instructed to do so by these procedures, do not replace the adapter because of a tripped PTC resistor.

A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off. Wait 5 minutes for the PTC resistor to fully cool, then retest.

These procedures determine if the PTC resistor is still tripped and then determine if there is a short somewhere on the SCSI bus.

External SCSI-2 Differential Adapter Bus PTC Isolation Procedure

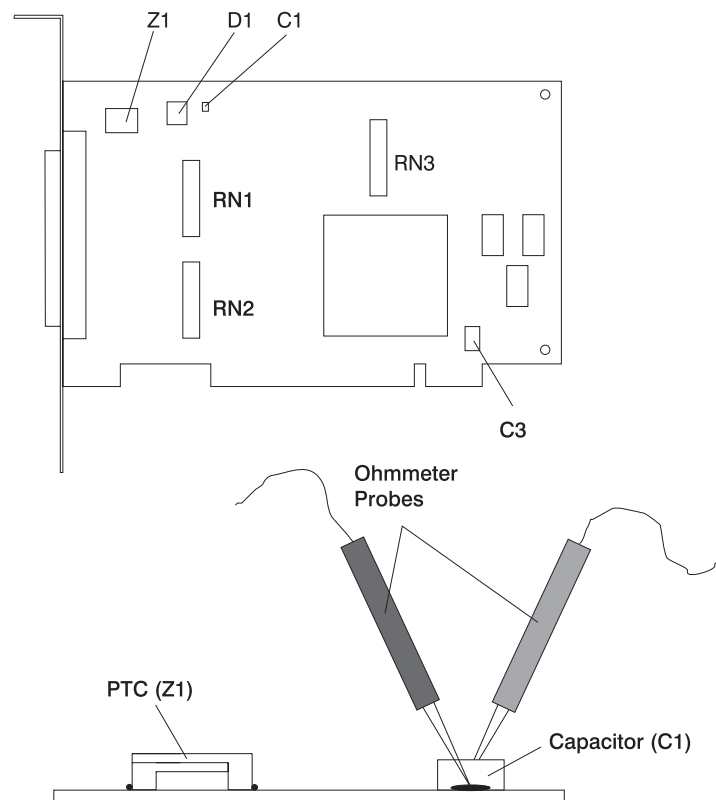
Isolate the external SCSI bus PTC fault with the following procedure:

Notes:

1. Only the probe tips are touching the solder joints. Do not allow the probes to touch any other part of the component.
 2. The external bus is differential.
1. Ensure that system power and all externally attached device power is turned off.

2. Check to ensure all devices are marked SCSI Differential and that the terminator on the end of the SCSI bus is also marked differential. If not, you may have a single-ended SCSI device or terminator on the differential SCSI bus. Single-ended devices do not work on a differential SCSI bus and may cause a PTC type error to be reported. The entire SCSI bus may appear to be intermittent. After ensuring the system is completely differential, continue.
3. Disconnect the external cables from the adapter and remove the adapter from the system.
4. Verify with a digital Ohmmeter that the internal PTC resistor, labeled Z1, (refer to the illustration on page "External SCSI-2 Differential Adapter Bus PTC Isolation Procedure" on page 278) is cool and in a low resistance state, typically less than 1/2 Ohm. Measuring across, be sure to probe both sides of the PTC resistor where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC resistor to cool and measure again.

SCSI-2 Differential Fast/Wide PCI Adapter



5. This step determines if there is a short on the adapter. Locate capacitor C1 and measure the resistance across it using the following procedure:
 - a. Connect the negative lead to the side of the capacitor marked "GND". Be sure to probe at the solder joint where the capacitor and board come together.
 - b. Connect the positive lead to the side of the capacitor marked "Cathode D1" on the board near C1. Be sure to probe at the solder joint where the capacitor and board come together.
 - If there is no fault present, then the resistance reading is 25 to 35 Ohms. The adapter is not faulty. Continue to the next step.
 - If the resistance measured is higher than 35 Ohms, check to see if RN1, RN2, and RN3 are plugged into their sockets. If these sockets are empty, you are working with a Multi-Initiators or High-Availability system. With these sockets empty, a resistive reading across C1 cannot be verified other than it measures a high resistance (not a short). If the resistance measurement is not low enough to be suspected as a fault (lower than 10 Ohms), continue to the next step.

- If the resistance is high and there is no external cable to reattach, there is no apparent cause for the PTC diagnostic failure.
 - If the resistance reading is low, typically below 10 Ohms, there is a fault. Because there are no cables attached, the fault is on the adapter. Replace the adapter.
 - If the resistance measured was high and there is an external cable to reattach, proceed to the next step.
6. Reattach the external cable to the adapter.
 - a. Measure across C1 as previously described.
 - b. If the resistance is between 10 to 20 Ohms, there is no apparent cause for a PTC resistor failure.
 - c. If the resistance is less than 10 Ohms, there is a possibility of a fault on the external SCSI bus. Troubleshoot the external SCSI bus by disconnecting devices and terminators. Measure across C1 to determine if the fault has been removed.

SCSI-2 Differential Adapter Probable Tripped PTC Causes

The following list provides some suggestions of things to check when the PTC is tripped:

- A shorted terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by incorrectly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- Plugging or unplugging a cable or terminator while the system is turned on (hot-plugging).
- A shorted device.
- Single-ended devices are attached to the differential SCSI bus.

Dual-Channel Ultra SCSI Adapter PTC Failure Isolation Procedure

Use the following procedures if diagnostics testing indicates a potential positive temperature coefficient (PTC) resistor fault or the TERMPWR Shorted LED is lit.

This procedure is used for SRNs 637-240 and 637-800 on the Dual-Channel Ultra SCSI Adapter. If the TERMPWR Shorted LED is lit, use this procedure to help isolate the source of the problem on the failing channel.

1. Identify the adapter by its label of 4-R on the external bracket. Then, determine if the failure is on channel A or channel B.
2. The same PTC is used for both the internal and external buses. The PTC protects the SCSI bus from high currents due to shorts on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off.

Wait 5 minutes for the PTC resistor to fully cool, then retest.

3. If this same error persists, or the TERMPWR Shorted LED is lit, replace the components of the failing channel in the following order (wait five minutes between steps):
 - a. If the failure is on the external cable, replace the following:
 - 1) Cable
 - 2) Device
 - 3) Attached subsystem
 - 4) Adapter
 - b. If the failure is on the internal cable, replace the following:
 - 1) Cable
 - 2) Device

- 3) Backplane
- 4) Adapter
- c. If the failure persists, verify that the parts exchanged are in the correct channel (internal or external, A or B).
If the errors are still occurring, continue isolating the problem by going to “MAP 0050: SCSI bus problems” on page 295.

64-bit PCI-X Dual Channel SCSI Adapter PTC Failure Isolation Procedure

Use the following procedures if diagnostics testing indicates a potential self-resetting thermal fuse problem. This procedure is used for SRN 2524-702 on the integrated dual-channel SCSI adapter in a 7039/651 system.

1. Identify the adapter as the one embedded in the system board. Then, determine if the failure is on channel 0 or channel 1.
2. The thermal fuse protects the SCSI bus from high currents due to shorts on the terminator, cable, or device. It is unlikely that the thermal fuse can be tripped by a defective adapter. A fault (short-circuit) causes an increase in resistance and temperature of the thermal fuse. The increase in temperature causes the thermal fuse to halt current flow. The thermal fuse returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off.
Wait 10 seconds for the thermal fuse to reset itself and recover, then retest.
3. If the same error persists, replace the components of the failing channel in the following order. Wait 10 seconds for the thermal fuse to reset itself between steps.
 - a. Cable
 - b. Device
 - c. DASD backplane (if present)
 - d. System board (adapter)
4. If the failure persists, verify that the parts exchanged are in the correct channel (0 or 1). If the errors are still occurring, continue isolating the problem by going to “MAP 0050: SCSI bus problems” on page 295.

Hot-Swap FRU problem resolution

Use this procedure to exchange hot-swappable field replaceable units (FRUs).

Note: The FRU you want to hot plug might have a defect on it that can cause the hot-plug operation to fail. If, after following the hot-plug procedure, you continue to get an error message that indicates that the hot-plug operation has failed, schedule a time for deferred maintenance when the system containing the FRU can be powered down. Then go to MAP 0210: General problem resolution, Step 0210-2 and answer NO to the question **Do you want to exchange this FRU as a hot-plug FRU?**

Attention: If the FRU is a disk drive or an adapter, ask the system administrator to perform the steps necessary to prepare the device for removal.

• Step 0220-1

1. If the system displayed a FRU part number on the screen, use that part number to exchange the FRU.
If there is no FRU part number displayed on the screen, refer to the SRN listing. Record the SRN source code and the failing function codes in the order listed.
2. Find the failing function codes in the FFC listing, and record the FRU part number and description of each FRU.
3. To determine if the part is hot-swappable, refer to the Chapter 3, “Locating FRUs,” on page 347 procedure for the part.

Does this system unit support hot-swapping of the first FRU listed?

NO Go to “General problem resolution” on page 268.

YES Go to Step 0220-2.

- **Step 0220-2**

Is the FRU a hot-swap power supply or fan?

NO Go to Step 0220-4.

YES Go to Step 0220-3.

- **Step 0220-3**

Note: Refer to the Chapter 3, “Locating FRUs,” on page 347 procedure for the part .

1. Remove the old FRU.
 2. Install the new FRU.
 3. Enter the **diag** command.
- Go to Step 0220-14.

- **Step 0220-4**

Is the FRU a hot-plug PCI adapter?

NO Go to Step 0220-5.

YES Go to Step 0220-12.

- **Step 0220-5**

Is the FRU a SCSI hot-plug device?

NO Go to Step 0220-11.

YES Go to Step 0220-6.

- **Step 0220-6**

Is the hot-plug drive located within a system unit?

NO Go to Step 0220-8.

YES Go to Step 0220-7.

- **Step 0220-7**

Refer to the removing and replacing procedures for your system in Chapter 3, “Locating FRUs,” on page 347.

Go to Step 0220-13.

- **Step 0220-8**

Does the hot-plug drive’s enclosure have procedures for removing and replacing SCSI disk drives?

NO Go to Step 0220-9.

YES If a hot-plug procedure exists, use that procedure to remove the old hot-plug SCSI disk drive and replace it with a new hot-plug SCSI disk drive. Otherwise, if no hot-plug procedure exists, use the power off procedure to remove the old SCSI disk drive and replace it with a new SCSI disk drive. Go to Step 0220-13.

- **Step 0220-9**

1. Ask the customer to back up the data on the drive that you intend to replace onto another drive.
2. Verify that the disk drive is in the defined state. The amber LED on the hot-plug disk drive should be off.

Is the hot-plug disk drive’s amber LED unlit?

NO Ask the customer to remove the hot-plug disk drive from the operating system configuration (refer the customer to the system management guide for more information).

YES Go to Step 0220-10.

- **Step 0220-10**

Using the hot-plug task service aid, replace the hot-plug drive using the following procedure:

1. Use the **List the SES Devices** option to show the configuration of the hot-plug slots. Identify the slot number of the adapter for the FRU you want to replace.
2. Select the **REPLACE/REMOVE a Device Attached to an SES Device** option.
3. Select the slot which contains the SCSI hot-plug drive you wish to replace. Press Enter. You will see a fast blinking green light on the front on the hot-plug drive indicating that it is ready for removal.

Note: Refer to the "Installing hardware" section of the information; locate the server information that you are servicing and follow the tables to locate the correct removal or replacement procedure.

4. Remove the old hot-plug drive.
5. Install the new hot-plug drive. Once the hot-plug drive is in place, press Enter.
6. Press the exit key. Wait while configuration is done on the drive, until you see the "hot-plug task" on the service aid menu.

Go to Step 0220-15.

- **Step 0220-11**

Attention: Removing functioning disks in a disk array attached to a PCI-X SCSI RAID controller is not recommended without assistance from your service support structure. A disk array may become degraded or failed if functioning disks are removed and additional problems may be created. If you still need to remove a RAID array disk attached to a PCI-X SCSI RAID controller, use the SCSI and "SCSI RAID hot-plug manager."

Using the hot plug-task service aid, replace the hot-plug drive using the hot plug RAID service aid:

Note: The drive you wish to replace must be either a SPARE or FAILED drive. Otherwise, the drive would not be listed as an "Identify and remove resources" selection within the RAID HOT-PLUG DEVICES screen. In that case you must ask the customer to put the drive into FAILED state. Refer the customer to the System Management Guide for more information. Ask the customer to back up the data on the drive that you intend to replace.

1. Select the **RAID HOT-PLUG DEVICES** option within the **HOT-PLUG TASK** under **DIAGNOSTIC SERVICE AIDS**.
2. Select the RAID adapter that is connected to the RAID array containing the RAID drive you wish to remove, then select **COMMIT**.
3. Choose the **IDENTIFY** option in the IDENTIFY AND REMOVE RESOURCES menu.
4. Select the physical disk which you wish to remove from the RAID array and press Enter.
5. The disk will go into the **IDENTIFY** state, indicated by a flashing light on the drive. Verify that it is the physical drive you wish to remove, then press Enter.
6. At the IDENTIFY AND REMOVE RESOURCES menu, choose the **REMOVE** option and press Enter.
7. A list of the physical disks in the system which may be removed will be displayed. If the physical disk you wish to remove is listed, select it and press Enter. The physical disk will go into the REMOVE state, as indicated by the LED on the drive. If the physical disk you wish to remove is not listed, it is not a SPARE or FAILED drive. Ask the customer to put the drive in the FAILED state before you can proceed to remove it. Refer the customer to the System Management Guide for more information.
8. Refer to service guide for the system unit or enclosure that contains the physical drive for removal and replacement procedures for the following substeps:
 - a. Remove the old hot-plug RAID drive.
 - b. Install the new hot-plug RAID drive. Once the hot-plug drive is in place, press Enter. The drive will exit the REMOVE state, and will go to the NORMAL state once you exit diagnostics.

Note: There are no elective tests to run on a RAID drive itself under diagnostics (the drives are tested by the RAID adapter).

9. This completes the repair. Return the system to the customer. Ask the customer to add the physical disk drive to the original configuration within the RAID. Refer them to system management guide for more information.

- **Step 0220-12**

1. Remove the old adapter FRU and replace it with the new adapter FRU. Refer to the Chapter 3, "Locating FRUs," on page 347 procedure for the part.
2. Enter the diag command.
3. Go to the FUNCTION SELECTION menu, and select the Advanced Diagnostics Routines option.
4. When the DIAGNOSTIC MODE SELECTION menu displays, select the System Verification option.
5. Go to Step 0220-14.

- **Step 0220-13**

1. If not already running diagnostics, enter the diag command.

Note: If you are already running service mode diagnostics and have just performed the **Configure Added/Replaced Devices** task (under the SCSI Hot Swap manager of the Hot Plug Task service aid), you must use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS menu before proceeding with the next step, or else the drive might not appear on the resource list.

2. Go to the FUNCTION SELECTION menu, and select the **Advanced Diagnostics Routines** option.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the **System Verification** option.

Does the hot-plug SCSI disk drive you just replaced appear on the resource list?

NO Verify that you have correctly followed the procedures for replacing hot-plug SCSI disk drives in the system service guide. If the disk drive still does not appear in the resource list, go to "General problem resolution" on page 268 to replace the resource that the hot-plug SCSI disk drive is plugged in to.

YES Go to Step 0220-14.

- **Step 0220-14**

Run the diagnostic test on the FRU you just replaced.

Did the diagnostics run with no trouble found?

NO Go to Step 0220-15.

YES Go to Chapter 5, "Verifying a repair," on page 611. Before returning the system to the customer, if a hot-plug disk has been removed, ask the customer to add the hot-plug disk drive to the operating system configuration. Refer to system management guide for more information."

- **Step 0220-15**

1. Use the **Log Repair Action** option in the TASK SELECTION menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with your repair action. If it is not displayed on the resource list, select **sysplanar0**.

Note: On systems with a fault indicator LED, this changes the fault indicator LED from the "fault" state to the "normal" state.

2. While in diagnostics, go to the FUNCTION SELECTION menu. Select the **Advanced Diagnostics Routines** option.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the **system verification** option. Run the diagnostic test on the FRU you just replaced, or **sysplanar0**.

Did the diagnostics run with no trouble found?

NO Go to Step 0220-16.

YES If you changed the service processor or network settings, restore the settings to the value they had prior to servicing the system. If you performed service on a PCI RAID subsystem involving changing of the RAID adapter cache card or changing the configuration on RAID disks, ask the customer to run "PCI SCSI disk array manager" using smitty to resolve the PCI SCSI RAID adapter configuration. The following is an example of how the customer would resolve the configuration:

1. At the AIX command line, type `smitty pdam`.
2. On the "PCI SCSI Disk Array Manager" screen, select **RECOVERY OPTIONS**.
3. If a previous configuration exists on the replacement adapter, this must be cleared. Select Clear PCI SCSI RAID Adapter Configuration. Press F3.
4. On the "Recovery Options" screen, select **RESOLVE PCI SCSI RAID ADAPTER CONFIGURATION**.
5. On the "Resolve PCI SCSI RAID Adapter Configuration" screen, select **ACCEPT CONFIGURATION** on **DRIVES**.
6. On the PCI SCSI RAID Adapter selection menu, select the adapter that you changed.
7. On the next screen, press Enter.
8. When you get the "Are You Sure?" selection menu, press Enter to continue.
9. You should get an OK status message when the recovery is complete. If you get a Failed status message, verify that you are doing recovery on the correct adapter, then do this complete procedure. When you complete the recovery, exit smitty to return to the AIX command line.

Go to Chapter 5, "Verifying a repair," on page 611.

- **Step 0220-16**

Does the original problem persist?

NO If a FRU was replaced, run the log repair action service aid under the online diagnostics for the resource that was replaced. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**. If steps were taken to make the device ready for removal, inform the system administrator of the steps required to return the system to the original state. Go to Chapter 5, "Verifying a repair," on page 611.

YES Go to Step 0220-17.

- **Step 0220-17**

Have you exchanged all the FRUs that correspond to the failing function codes?

NO Go to Step 0220-18.

YES The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to "MAP 0030: Additional Problem Determination" on page 292.

- **Step 0220-18**

Note: Before proceeding, remove the FRU you just replaced and install the original FRU in its place.

Does the system unit support hot-swapping of the next FRU listed?

NO Go to "General problem resolution" on page 268.

YES The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to Step 0220-14.

MAP 0020: Problem determination procedure

Use this MAP to get a service request number (SRN) if the customer or a previous MAP provided none.

Purpose of this MAP

Use this MAP to get a service request number (SRN) if the customer or a previous MAP provided none. If you are unable to power the system on, refer to the "Power isolation procedures" on page 141.

- **Step 0020-1**

Visually check the server for obvious problems such as unplugged power cables or external devices that are powered off.

Did you find an obvious problem?

NO Go to Step 0020-2.

YES Fix the problem, then go to Chapter 5, "Verifying a repair," on page 611.

- **Step 0020-2**

Are the AIX online diagnostics installed?

Note: If AIX is not installed on the server or partition, answer no to the above question.

NO If the operating system is running, perform its shutdown procedure. Get help if needed. Go to Step 0020-4.

YES Go to Step 0020-3.

- **Step 0020-3**

Note: When possible, run online diagnostics in service mode. Online diagnostics perform additional functions compared to standalone diagnostics.

Run online diagnostics in concurrent mode when the customer does not let you power-off the system unit. To run online diagnostics in service mode, go to substep 5. If the system unit is already running in the service mode and you want to run online diagnostics, proceed to the question at the bottom of this MAP step. Otherwise, continue with 1 through 4 in the following procedure.

1. Log in with root authority or use CE login. If necessary, ask the customer for the password.
2. Enter the **diag -a** command to check for missing resources.
 - a. If you see a command line prompt, proceed to substep 3 below.
 - b. If the DIAGNOSTIC SELECTION menu is displayed, with the letter M shown next to any resource, select that resource, then press Commit (F7 key). Follow any instructions displayed. If you are prompted with a message Do you want to review the previously displayed error select **Yes** and press Enter. If an SRN displays, record it, and go to Step 0020-15. If there is no SRN, go to substep 3 below.
 - c. If MISSING RESOURCE menu is displayed, follow any instructions displayed. If you are prompted with a message Do you want to review the previously displayed error select **Yes** and press Enter. If an SRN displays, record it, and go to Step 0020-15. If there is no SRN, go to substep 3 below.
3. Enter the **diag** command.
4. Go to Step 0020-5.
5. If the operating system is running, perform its shut down procedure (get help if needed).
6. Turn off the system unit power and wait 45 seconds before proceeding.
7. Turn on the system unit power.
8. Load the online diagnostics in service mode.
9. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.

Are the Diagnostic Operating Instructions displayed?

NO Go to Step 0020-16.

YES Go to Step 0020-5.

- **Step 0020-4**

Note: If you are working on a partition, do not remove the power as directed in the following procedure. Only remove the power if you are working on a server that does not have multiple partitions.

1. If the server does not have multiple partitions, disconnect the power from the server, wait 45 seconds, then reconnect the power.
2. If the server supports slow boot (See "Performing a slow boot" on page 722) set the server to perform a slow boot for the next boot that is performed. If the system does not support slow boot, do a normal boot in the next step.
3. Refer to "Running the online and eServer stand-alone diagnostics" on page 729 to load the standalone diagnostics. Before continuing to the next step, ensure that the server power is turned on, or if you are working on a partition, the partition is started. The server or partition should be booting the standalone diagnostics from a CD-ROM or a network server.
4. Wait until the Diagnostic Operating Instructions display or the server boot appears to have stopped.

Are the Diagnostic Operating Instructions displayed?

NO Go to Step 0020-16.

YES Go to Step 0020-5.

• **Step 0020-5**

Are the Diagnostic Operating Instructions displayed (screen number 801001) with no obvious problem (for example, blurred or distorted)?

NO For display problems, go to Step 0020-12.

YES To continue with diagnostics, go to Step 0020-6.

• **Step 0020-6**

Press the Enter key.

Is the FUNCTION SELECTION menu displayed (screen number 801002)?

NO Go to Step 0020-13.

YES Go to Step 0020-7.

• **Step 0020-7**

1. Select the **ADVANCED DIAGNOSTICS ROUTINES** option.

Notes:

- a. If the terminal type is not defined, do so now. You cannot proceed until this is complete.
 - b. If you have SRNs from a Previous Diagnostics Results screen, process these Previous Diagnostics Results SRNs prior to processing any SRNs you may have received from an SRN reporting screen.
2. If the DIAGNOSTIC MODE SELECTION menu (screen number 801003) displays, select the **PROBLEM DETERMINATION** option.
 3. Find your system response in the following table. Follow the instructions in the Action column.

System Response	Action
Previous Diagnostic Results. Do you want to review the previously displayed error?	<p>You have a pending item in the error log for which there is no corresponding Log Repair Action. To see this error, select YES at the prompt.</p> <p>Information from the error log is displayed in order of last event first. Record the error code, the FRU names and the location code of the FRUs.</p> <p>Go to Step 0020-15.</p>
The RESOURCE SELECTION menu or the ADVANCED DIAGNOSTIC SELECTION menu is displayed (screen number 801006).	<p>Go to Step 0020-8.</p>

System Response	Action
The system halted while testing a resource.	Record SRN 110-xxxx, where xxxx is the first four digits of the menu number displayed in the upper-right corner of the diagnostic menu. Go to Step 0020-15.
The MISSING RESOURCE menu is displayed or the letter M is displayed alongside a resource in the resource list.	<p>If the MISSING RESOURCE menu is displayed, follow the displayed instructions until either the ADVANCED DIAGNOSTIC SELECTION menu or an SRN is displayed. If an M is displayed in front of a resource (indicating that it is missing) select that resource then choose the Commit (F7 key).</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. Run any supplemental media that may have been supplied with the adapter or device, and then return to substep 1 of Step 0020-7. 2. If the SCSI enclosure services device appears on the missing resource list along with the other resources, select it first. 3. ISA adapters cannot be detected by the system. The ISA adapter configuration service aid in standalone diagnostics allows the identification and configuration of ISA adapters. <p>If the ADVANCED DIAGNOSTIC SELECTION menu is displayed, go to Step 0020-11.</p> <p>If an 8-digit error code is displayed, record it and perform problem analysis.</p> <p>If an SRN is displayed, record it, and go to Step 0020-15.</p>
The message The system will now continue the boot process is displayed continuously on the system unit's console.	Go to Step 0020-4.
The message Processing supplemental diagnostic diskette media is displayed continuously on the system unit's console.	Call your service support structure.
<p>The diagnostics begin testing a resource.</p> <p>Note: If the problem determination option was selected from the DIAGNOSTIC MODE SELECTION menu, and if a recent error has been logged in the error log, the diagnostics automatically begin testing the resource.</p>	<p>Follow the displayed instructions.</p> <p>If the No Trouble Found screen is displayed, press Enter.</p> <p>If another resource is tested, repeat this step.</p> <p>If the ADVANCED DIAGNOSTIC SELECTION menu is displayed, go to Step 0020-11.</p> <p>If an SRN is displayed, record it, and go to Step 0020-15.</p> <p>If an 8-digit error code is displayed, perform problem analysis using the error code.</p>
The system did not respond to selecting the advanced diagnostics option.	Go to Step 0020-13.
A system unit with a beeper did not beep while booting.	Record SRN 111-947 and then go to Step 0020-15
The system unit emits a continuous sound from the beeper.	Record SRN 111-947 and then go to Step 0020-15.
An SRN or an eight-digit error code is displayed.	<p>Record the error code, the FRU names, and the location code for the FRUs. If a SRN is displayed, go to Step 0020-15.</p> <p>If an 8-digit error code is displayed, perform problem analysis using the error code.</p>

System Response	Action
The system stopped with a 3-digit or 4-digit code displayed in the operator panel display.	Record SRN 101-xxx (where xxx is the rightmost three digits of the displayed code). Go to Step 0020-15.
An 888 message is displayed in the operator panel display. Note: The 888 may or may not be flashing.	Go to "MAP 0070: 888 sequence in operator panel display" on page 304.

- **Step 0020-8**

On the DIAGNOSTIC SELECTION or ADVANCED DIAGNOSTIC SELECTION menu, look through the list of resources to make sure that all adapters and SCSI devices are listed including any new resources.

Notes:

1. Resources attached to serial and parallel ports may not appear in the resource list.
2. If running diagnostics in a partition within a partitioned system, resources assigned to other partitions will not be displayed on the resource list.

Did you find the all the adapters or devices on the list?

NO Go to Step 0020-9.

YES Go to Step 0020-11.

- **Step 0020-9**

Is the new device or adapter an exact replacement for a previous one installed at same location?

NO Go to Step 0020-10.

YES The replacement device or adapter may be defective. If possible, try installing it in an alternate location if one is available; if it works in that location, then suspect that the location where it failed to appear has a defective slot; schedule time to replace the hardware that supports that slot. If it does not work in alternate location, suspect a bad replacement adapter or device. If you are still unable to detect the device or adapter, contact your service support structure.

- **Step 0020-10**

Is the operating system software to support this new adapter or device installed?

NO Load the operating system software.

YES The replacement device or adapter may be defective. If possible, try installing it in an alternate location if one is available; if it works in that location, then suspect that the location where it failed to appear has a defective slot; schedule time to replace the hardware that supports that slot. If it does not work in alternate location, suspect a bad replacement adapter or device. If you are still unable to detect the device or adapter, contact your service support structure.

- **Step 0020-11**

Select and run the diagnostic test problem determination or system verification on one of the following:

- The resources with which the customer is having problems. If the resource is not shown on the DIAGNOSTIC SELECTION menu, then run diagnostics on its parent (the adapter or controller to which the resource is attached).
- The resources you suspect are causing a problem.
- All resources.

Note: When choosing **All Resources**, interactive tests are not done. If no problem is found running **All Resources** you should choose each of the individual resources on the selection menu to run diagnostics tests on to do the interactive tests

Find the response in the following table or follow the directions on the test results screen.

Diagnostic Response	Action
An SRN or an eight-digit error code is displayed on the screen.	Record the error code, the FRU names, and the location code for the FRUs. If an SRN is displayed, go to Step 0020-15. If an 8-digit error code is displayed, go to the information center, and perform a search on the error code to obtain the name and location of the failing FRU. Perform the listed action.
The TESTING COMPLETE menu and the No trouble was found message are displayed, and you have not tested all of the resources.	Press Enter and continue testing other resources.
The TESTING COMPLETE menu and the No trouble was found message are displayed, and you have tested all of the resources.	Go to Step 0020-14. Note: If you have not run the sysplanar test, do so before going to Step 0020-14.
The system halted while testing a resource.	Record SRN 110-xxxx, where xxxx is the first three or four digits of the menu number displayed in the upper-right corner of the diagnostic menu screen. Go to Step 0020-15.
When running the Online Diagnostics, an installed device does not appear in the test list.	Ensure that the diagnostic support for the device was installed. The display configuration service aid can be used to determine whether diagnostic support is installed for the device. Record SRN 110-101. Go to Step 0020-15. Note: Supplemental diskettes may be required if service aids are run from standalone diagnostics.
The IBM ARTIC960 Quad T1/E1 adapter diagnostics display a message indicating that the interface board (PMC) is either not installed or is malfunctioning.	Install a PMC board if not already installed. When running online diagnostics on any of the IBM ARTIC960 family of adapters and the message indicates that the PMC (daughter board) is not installed, but it is installed, do the following: <ul style="list-style-type: none"> • Reseat the PMC board, then run diagnostics. • If the response is the same, replace the PMC and then go to Chapter 5, "Verifying a repair," on page 611.
The symptom was not found in the table.	Perform problem analysis using the symptom.

• Step 0020-12

The following step analyzes a console display problem.

Find your type of console display in the following table. Follow the instructions given in the Action column.

Type of Console Display	Action
TTY-type terminal	Be sure the TTY terminal attributes are set correctly. See "Running the Diagnostic Programs from a TTY Terminal" in "Running the online and eServer stand-alone diagnostics" on page 729. If you did not find a problem with the attributes, go to the documentation for this type of TTY terminal, and continue problem determination. If you do not find the problem, record SRN 111-259, then go the Step 0020-15.
Graphics display	Go to the documentation for this type of graphics display, and continue problem determination. If you do not find the problem, record SRN 111-82c, then go to Step 0020-15.

Type of Console Display	Action
HMC (Hardware Management Console)	Go to the HMC service procedures in <i>Service Guide for the Hardware Management Console Models 7042-CR4, 7042-C06 and 7042-C07</i> , SA76-0120. If HMC tests find no problem, there may be a problem with the communication between the HMC and the managed system. If the HMC communicates with the managed system through a network interface, verify whether the network interface is functional. If the HMC communicates with the managed system through the HMC interface, check the cable between the HMC and the managed system. If it is not causing the problem, suspect a configuration problem of the HMC communications setup.

• **Step 0020-13**

There is a problem with the keyboard.

Find the type of keyboard you are using in the following table. Follow the instructions given in the Action column.

Keyboard Type	Action
Type 101 keyboard (U.S.). Identify by the size of the Enter key. The Enter key is in only one horizontal row of keys.	Record SRN 111-736, then go to Step 0020-15.
Type 102 keyboard (W.T.). Identify by the size of the Enter key. The Enter key extends into two horizontal rows.	Record SRN 111-922; then go to Step 0020-15.
Kanji-type keyboard. (Identify by the Japanese characters.)	Record SRN 111-923; then go to Step 0020-15.
TTY terminal keyboard	Go to the documentation for this type of TTY terminal and continue problem determination.
HMC (Hardware Management Console)	Go to the HMC service procedures in <i>Service Guide for the Hardware Management Console Models 7042-CR4, 7042-C06 and 7042-C07</i> , SA76-0120. If HMC tests find no problem, there may be a problem with the communication between the HMC and the managed system. If the HMC communicates with the managed system through a network interface, verify whether the network interface is functional. If the HMC communicates with the managed system through the HMC interface, check the cable between the HMC and the managed system. If it is not causing the problem, suspect a configuration problem of the HMC communications setup.

• **Step 0020-14**

The diagnostics did not detect a problem.

If the problem is related to either the system unit or the I/O expansion box, refer to the service documentation for that unit.

If the problem is related to an external resource, use the problem determination procedures, if available, for that resource.

If a problem occurs when running online diagnostics but not when running the stand-alone diagnostics, suspect a software problem.

Check for the presence of supplemental diagnostic material, such as diskettes or documentation.

This is possibly a problem with software or intermittent hardware. If you think that you have an intermittent hardware problem, go to "MAP 0040: Intermittent Problem Isolation" on page 293.

• **Step 0020-15**

Take the following actions:

1. Handle multiple SRNs and error codes in the following order:
 - a. 8-Digit Error Codes.

- b. SRNs with a source code other than F or G.
- c. SRNs with a source code of F. Run online diagnostics in advanced and problem determination mode to obtain maximum isolation.
- d. SRNs with a source code of G.

Note: The priority for multiple SRNs with a source of G is determined by the time stamp of the failure. Follow the action for the SRN with the earliest time stamp first.

- e. Device SRNs and error codes (5-digit SRNs).

If a group has multiple SRNs, it does not matter which SRN is handled first.

2. Find the SRN.

Note: If the SRN is not listed, look for it in the following:

- Any supplemental service manual for the device
- The diagnostic problem report screen for additional information
- The "Service Hints" service aid in "Running the online and eServer stand-alone diagnostics" on page 729

3. Perform the action listed.

4. If you replace a part, go to t.

• Step 0020-16

Look up the AIX IPL progress codes for definitions of configuration program indicators. They are normally 0xxx.

Is a configuration program indicator displayed?

NO Go to the "Problems with loading and starting the operating system (AIX and Linux)" on page 268

YES Record SRN 101-xxxx (where xxxx is the rightmost three or four digits or characters of the configuration program indicator). Go to Step 0020-17.

• Step 0020-17

Is a physical location code or an AIX location code displayed on the operator panel display?

NO Go to Step 0020-15.

YES Record the location code, then go to Step 0020-15.

MAP 0030: Additional Problem Determination

This MAP is used for problems that still occur after all FRUs indicated by the SRN or error code have been exchanged.

Purpose of This MAP

This MAP is used for problems that still occur after all FRUs indicated by the SRN or error code have been exchanged.

Note: Check the action text of the SRN before proceeding with this MAP. If there is an action listed, perform that action before proceeding with this MAP.

• Step 0030-1

Some external devices (including rack drawers that contain devices) have their own problem determination procedures. If the problem is related to an external device that has its own problem determination procedure, run those procedures if not already run. If they do not correct the problem, continue with this MAP.

• Step 0030-2

The problem may have been caused by a resource that has not been tested. System Checkout tests all resources. If the online Diagnostics are installed and you are able to load them, then **All Resources** under the Diagnostic Selection menu should be run. If you get a different SRN, look up the SRN in the SRN chapters and do the listed action. If you are unable to run **All Resources** under the Diagnostic Selection menu or you do not get another SRN when running it, continue with this MAP.

- **Step 0030-3**

If the problem is related to a SCSI device, SCSI bus, or SCSI controller, go to “MAP 0050: SCSI bus problems” on page 295. If you are unable to isolate the problem with MAP 0050, continue with Step 0030-4.

- **Step 0030-4**

1. Find the resource(s) that are identified by the SRN or error code in the following table.
2. Perform the first action listed for the resource.
3. If you exchange a FRU or change a switch setting, test the resource again.
4. If the action does not correct the problem, perform the next action until all actions have been tried. If an action says to exchange a FRU that you have already exchanged, go to the next action. If an action corrects the problem, go to Chapter 5, “Verifying a repair,” on page 611.
5. If you perform all of the actions and do not correct the problem, check the Service Hints service aid for information. If the service aid does not help, call your service support structure.

Failing Resource	Repair Action
SCSI Device	Exchange the SCSI controller. Replace the power supply.
Pluggable SCSI or IDE controller	Exchange the backplane into which the adapter is plugged.
Keyboard, tablet, mouse, dials, LPF keys, diskette drive	Check the cable attaching the device to its adapter. If you do not find a problem, exchange the device's adapter.
Pluggable adapters, CPU cards, and controllers	Determine whether the adapter contains any attached FRUs such as fuses, DRAMs, and crossover cables. <ol style="list-style-type: none"> 1. Check or exchange any attached FRU on the resource. 2. If the adapter is plugged into a riser card, check or exchange the riser card. 3. Exchange the backplane into which the adapter is plugged.
System and I/O backplanes	Contact your service support structure.
Built-In system ports	Replace the service processor if present.
A device attached to the system by a cable and an adapter.	<ol style="list-style-type: none"> 1. Replace the adapter for the device. 2. Replace the cable to the device.
IDE Device	Replace the cable between the IDE controller and the device. If the IDE controller is packaged on a backplane, replace that backplane, otherwise replace the adapter containing the IDE controller.

MAP 0040: Intermittent Problem Isolation

This MAP provides a structured way of analyzing intermittent problems.

Purpose of This MAP

This MAP provides a structured way of analyzing intermittent problems. It consists of two tables: Hardware Symptoms and Software Symptoms.

Because software or hardware can cause intermittent problems, consider all symptoms relevant to your problem.

How to Use This MAP

This MAP contains information about causes of intermittent symptoms. In the following tables, find your symptoms, and read the list of things to check.

When you exchange a FRU, go to Chapter 5, “Verifying a repair,” on page 611 to check out the system.

Hardware Symptoms

Note: This table spans several pages.

Symptom of Hardware Problem	Things to Check For
Any hardware log entry in the error log.	<p>Use the Hardware Error Report service aid to view the error log and check for:</p> <ul style="list-style-type: none">• Multiple errors on devices attached to the same SCSI bus.• Multiple errors on devices attached to the same async adapter.• Multiple errors on internally installed devices only. <p>Contact your service support structure for assistance with error report interpretation.</p>
Hardware-caused system crashes	<ul style="list-style-type: none">• The connections on the CPU planar or CPU card• Memory modules for correct connections• Connections to the system planar.• Cooling fans operational• The environment for a too-high or too-low operating temperature.• Vibration: proximity to heavy equipment.
System unit powers off a few seconds after powering On.	<ul style="list-style-type: none">• Fan speed. Some fans contain a speed-sensing circuit. If one of these fans is slow, the power supply powers the system unit off.• Correct voltage at the outlet into which the system unit is plugged.• Loose power cables and fan connectors, both internal and external.
System unit powers off after running for more than a few seconds.	<ul style="list-style-type: none">• Excessive temperature in the power supply area.• Loose cable connectors on the power distribution cables.• Fans turning at full speed after the system power has been on for more than a few seconds.
Only internally installed devices are failing.	<p>Check the following items that are common to more than one device:</p> <ul style="list-style-type: none">• Ground connections on all of the disk drives and other types of drives installed.• Loose connections on the power cables to the planars, drives, fans, and battery.• System unit cooling. Is the input air temperature within limits? Are all the fans running at full speed? Are any of the vent areas blocked?• Signal cables to the diskette drives, and the power supply.• SCSI device signal cables for loose connectors and terminators.• Loose SCSI device address jumpers.• Possible contamination of any device that has a cleaning procedure. See the operator guide for cleaning instructions.• Excessive static electricity.• Correct voltage at the system unit power outlet

Symptom of Hardware Problem	Things to Check For
Only externally attached devices are failing.	<p>Check the following items that are common to more than one device.</p> <ul style="list-style-type: none"> • Check the SCSI signal cables to the devices for loose connectors and terminators. • Check devices that use jumpers to set the SCSI address for loose jumpers. • Check any device that has a cleaning procedure for contamination. See the operator guide for cleaning instructions. • Check for excessive static electricity. • Check the outlet that the device is plugged into for correct voltage. • Check the error log for entries for the adapter driving the failing devices. • Check the temperature of the devices. Are the cooling vents blocked? Are the fans running? • Check for other devices near the failing device that may be radiating noise (displays, printers, and so on).

Software Symptoms

Symptom of Software Problem	Things to Check For
Any symptom you suspect is related to software.	<p>Use the software documentation to analyze software problems.</p> <p>Check the RETAIN® database for known problems with your type of system unit or software.</p>
Software-caused system crashes	<p>Check the following software items:</p> <ul style="list-style-type: none"> • Is the problem only with one application program? • Is the problem only with one device? • Does the problem occur on a recently installed program? • Was the program recently patched or modified in any way? • Is the problem associated with any communication lines? • Check for static discharge occurring at the time of the failure.

MAP 0050: SCSI bus problems

Use this MAP to analyze problems with a SCSI bus.

Purpose of this MAP

Use this MAP to analyze problems with a SCSI bus.

Considerations

- To prevent hardware damage or erroneous diagnostic results from a system with its power turned on, use "PCI hot-plug manager" subtask "replace/remove PCI hot plug adapter" before connecting or disconnecting cables or devices.
- Also, use this MAP for SCSI adapters that are built into system backplanes or I/O backplanes. If this procedure calls for replacing a SCSI adapter and the SCSI adapter is built into the system backplane or I/O backplane, replace the system backplane or I/O backplane as appropriate.
- If the failure is a terminator power failure (SRNs xxx-226, xxx-240, xxx-800), always allow five minutes for the PTC to cool.
- The differential version of the adapter has socket-type terminators to support high-availability. If this is the adapter's configuration, the terminators would have been removed from the adapter. MAP steps requiring the removal of the cable from the adapter are inapplicable, since an adapter that is not

terminated always fails diagnostics. Proper SCSI diagnostics require proper termination. If the configuration involves a Y-cable, leave it, with the appropriate terminator, attached to the adapter. Or, place an external differential terminator on the external port.

- If the system uses shared disk-drive hardware or a high-availability configuration, ensure that the other system that is sharing the devices is not using the devices. For additional information concerning high-availability configurations, see “SCSI service hints” on page 274.
- For intermittent problems that cannot be resolved with this MAP, refer to “SCSI service hints” on page 274.
- If the SCSI bus is attached to a RAID subsystem, refer to the RAID subsystem documentation for any problem determination. If the RAID adapter is a PCI-X RAID adapter, refer to the *PCI-X SCSI RAID Controller Reference Guide for AIX*.

Follow the steps in this MAP to isolate a SCSI bus problem.

Note: This procedure steps you through a process to systematically remove devices and components from a SCSI bus until a problem or a symptom or problem is eliminated. If you go through the whole procedure you will remove all components of a SCSI bus in the following order:

1. Hot-swap devices
2. Devices that are not hot-swap
3. SCSI Enclosure Services (SES) device or enclosures
4. SCSI cables
5. SCSI adapter

Do the following:

• **Step 0050-1**

Have changes been made recently to the SCSI configuration?

NO Go to Step 0050-2.

YES Go to Step 0050-5.

• **Step 0050-2**

Are there any hot-swap devices (SCSI disk drives or media devices) controlled by the adapter?

NO Go to Step 0050-3.

YES Go to Step 0050-11.

• **Step 0050-3**

Are there any devices other than hot-swappable devices controlled by the adapter?

NO Go to Step 0050-4.

YES Go to Step 0050-13.

• **Step 0050-4**

Is an enclosure or drawer that supports hot-swap devices controlled by the adapter?

NO Go to Step 0050-22.

YES Go to Step 0050-15.

• **Step 0050-5**

This step handles cases where recent changes have been made to the SCSI configuration.

Using the first three digits of the SRN, refer to the FFC listing and determine if the adapter is single-ended or differential.

Is the adapter a single-ended adapter?

NO Go to Step 0050-6.

YES Go to Step 0050-7.

- **Step 0050-6**

The adapter's termination jumper settings may be incorrect. Power off the system, and inspect jumper J7.

Are the jumpers correct?

NO Go to Step 0050-8.

YES Go to Step 0050-9.

- **Step 0050-7**

If the adapter *is not* being used in a high-availability configuration, be sure sockets RN1, RN2, and RN3 are populated.

If the adapter *is* being used in a high-availability configuration, be sure sockets RN1, RN2, and RN3 *are not* populated.

Go to Step 0050-9.

- **Step 0050-8**

1. Correct the jumper settings and reinstall the adapter and all cables.

2. Power on the system, and run diagnostics in system verification mode on the adapter.

Did the diagnostic pass?

NO Go to Step 0050-9.

YES Go to Step 0050-10.

- **Step 0050-9**

Check for the following problems:

- Address conflicts between devices.
- Cabling problems such as, configurations that exceed the maximum cable lengths, missing termination, or excessive termination.

Did you find a problem?

NO Go to Step 0050-2.

YES Go to Step 0050-10.

- **Step 0050-10**

1. Correct the problem.

2. Power on the system, and run diagnostics in system verification mode on the adapter.

Did a failure occur?

NO Go to Chapter 5, "Verifying a repair," on page 611.

YES Go to Step 0050-2.

- **Step 0050-11**

This step determines if a hot-swap device is causing the failure.

1. Go to "Preparing for hot-plug SCSI device or cable deconfiguration" on page 300.

2. Disconnect all hot-swap devices attached to the adapter.

3. Go to "After hot-plug SCSI device or cable deconfiguration" on page 301.

4. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.

5. Run the diagnostics in system verification mode on the adapter.

Did a failure occur?

NO Go to Step 0050-12.

YES Go to Step 0050-3.

- **Step 0050-12**

Go to “Preparing for hot-plug SCSI device or cable deconfiguration” on page 300. Reconnect the hot-plug devices one at a time. After reconnecting each device, do the follow:

1. Go to “After hot-plug SCSI device or cable deconfiguration” on page 301.
2. Rerun the diagnostics on the adapter.
3. If the adapter fails, the problem may be with the last device reconnected. Perform these substeps:
 - a. Follow repair procedures for that last device.
 - b. Rerun diagnostics on the adapter.
 - c. If diagnostics fail, replace the SES backplane corresponding to the slot for the device.
 - d. Rerun diagnostics.
 - e. If diagnostics fail, replace the last device.
 - f. Rerun diagnostics on the adapter.
 - g. If diagnostics pass, go to Chapter 5, “Verifying a repair,” on page 611. Otherwise, contact your support center.

Note: A device problem can cause other devices attached to the same SCSI adapter to go into the defined state. Ask the system administrator to make sure that all devices attached to the same SCSI adapter as the device that you replaced are in the available state.

4. If no errors occur, the problem could be intermittent. Make a record of the problem. Running the diagnostics for each device on the bus may provide additional information.

- **Step 0050-13**

This step determines if a device other than a hot-swappable device is causing the failure. Follow these steps:

1. Go to “Preparing for hot-plug SCSI device or cable deconfiguration” on page 300.
2. Disconnect all devices attached to the adapter (except for the device from which you boot to run diagnostics; you may want to temporarily move this device to another SCSI port while you are trying to find the problem).
3. Go to “After hot-plug SCSI device or cable deconfiguration” on page 301.
4. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.
5. Run the diagnostics in system verification mode on the adapter.

Did a failure occur?

NO Go to Step 0050-14.

YES Go to Step 0050-4.

- **Step 0050-14**

Reconnect the devices one at time. After reconnecting each device, follow this procedure:

1. Rerun the diagnostics in system verification mode on the adapter.
2. If there is a failure, the problem should be with the last device reconnected. Follow the repair procedures for that device, then go to Chapter 5, “Verifying a repair,” on page 611.
3. If no errors occur, the problem could be intermittent. Make a record of the problem. Running the diagnostics for each device on the bus may provide additional information.

- **Step 0050-15**

This step determines whether the SCSI Enclosure Services (SES) controller, which provides hot-plug capability for SCSI drives in the server, is causing the problem.

Note: In most cases the SES controller is integrated on the backplane that is used to connect SCSI devices, for example a disk drive backplane. If your system has hot-plug capability and the SES controller is separate from the SCSI drive backplane, there will be an intermediate card on the

SCSI bus between the SCSI adapter and the device or SCSI backplane. You will have to make a visual check to see if there are any intermediate cards on the SCSI bus that is displaying a problem.

Does a separate SES controller plug into the SCSI device backplane?

NO Go to Step 0050-18.

YES Go to Step 0050-16.

- **Step 0050-16**

Follow these steps:

1. Power off the system.
2. Remove the intermediate SES controller card. Locate the SES controller part number under Chapter 8, "Part Information," on page 741.
3. Power on the system.
4. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.
5. Run the diagnostics in system verification mode on the adapter.

Did a failure occur?

NO Go to Step 0050-17.

YES Go to Step 0050-18.

- **Step 0050-17**

Follow these steps:

1. Power off the system.
2. Replace the intermediate SES controller card.
3. Go to Chapter 5, "Verifying a repair," on page 611.

- **Step 0050-18**

Follow these steps:

1. Go to "Preparing for hot-plug SCSI device or cable deconfiguration" on page 300.
2. Disconnect all cables attached to the SCSI adapter. For SCSI differential adapters in a high-availability configuration, see Considerations.
3. Go to "After hot-plug SCSI device or cable deconfiguration" on page 301.
4. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.
5. Run the diagnostics in system verification mode on the adapter.

Did a failure occur?

NO Go to Step 0050-19.

YES Replace the adapter, then go to Chapter 5, "Verifying a repair," on page 611.

- **Step 0050-19**

Follow these steps:

1. Go to "Preparing for hot-plug SCSI device or cable deconfiguration" on page 300.
2. Reconnect the cables to the adapter.

Does the SES controller (an intermediated SES controller) plug into the backplane?

NO Go to Step 0050-20.

YES Go to Step 0050-21.

- **Step 0050-20**

Follow these steps:

1. Replace the SES controller. Locate the intermediate SES controller part number under Chapter 8, "Part Information," on page 741.
2. Power on the system.
3. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.
4. Run the diagnostics in system verification mode on the adapter.

Did a failure occur?

NO Go to Chapter 5, "Verifying a repair," on page 611.

YES Go to Step 0050-21.

• **Step 0050-21**

One of the cables remaining in the system is defective. Refer to Chapter 8, "Part Information," on page 741 for the cable part numbers. Replace the parts one at a time in the order listed. Follow these steps for each FRU replaced:

1. Rerun the diagnostics for the adapter.
2. If there is any failure, continue with the next FRU.
3. If there is no failure, go to Chapter 5, "Verifying a repair," on page 611.

• **Step 0050-22**

Follow these steps:

1. Go to "Preparing for hot-plug SCSI device or cable deconfiguration."
2. Disconnect all cables attached to the adapter (except for the cable to the device from which you boot to run diagnostics; you may want to temporarily move this device to another SCSI port while you are trying to find the problem).
3. Go to "After hot-plug SCSI device or cable deconfiguration" on page 301.
4. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.
5. Run the diagnostics on the adapter.

Did a failure occur?

NO Go to Step 0050-23.

YES Replace the adapter, then go to Chapter 5, "Verifying a repair," on page 611.

• **Step 0050-23**

One of the cables remaining in the system is defective. Refer to Chapter 8, "Part Information," on page 741 for the cable part numbers. Replace the parts one at a time in the order listed. Follow these steps for each FRU replaced:

1. Rerun the diagnostics for the adapter.
2. If there is any failure, continue with the next FRU.
3. If there is no failure, go to Chapter 5, "Verifying a repair," on page 611.

"Preparing for hot-plug SCSI device or cable deconfiguration"

Use this procedure when you are preparing to deconfigure a hot-plug SCSI device or cable. This procedure will help determine if a SCSI device or SCSI device cable is causing your system problem.

"After hot-plug SCSI device or cable deconfiguration" on page 301

Use this procedure after you deconfigure or hot-plug a SCSI device to ensure that the replaced component was successfully installed.

Preparing for hot-plug SCSI device or cable deconfiguration

Use this procedure when you are preparing to deconfigure a hot-plug SCSI device or cable. This procedure will help determine if a SCSI device or SCSI device cable is causing your system problem.

Purpose of this procedure:

Use this procedure to determine if a SCSI device or SCSI device cable is causing the symptom.

Disconnect all cables attached to the adapter, (except for the cable to the device from which you boot to run diagnostics; temporarily move these device cables to another SCSI port while you are trying to find the problem).

1. Go to "Running the online and eServer stand-alone diagnostics" on page 729 and perform the prerequisite tasks described in the Before you begin topic.
2. Determine which SCSI adapter you plan to remove the cables or devices from.
3. Adapter slots are numbered on the rear of the system unit, record the slot number and location of each adapter being removed.
4. Ensure that any processes or applications that might use the adapter are stopped.
5. Enter the system diagnostics by logging in as "root" user or as the "celogin" user. Type the **diag** command on the AIX command line.
6. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter. The FUNCTION SELECTION menu appears.
7. From the FUNCTION SELECTION menu, select Task Selection, then press Enter.
8. From the Task Selection list, select PCI Hot Plug Manager.
9. From the PCI Hot Plug Manager menu, select Unconfigure a Device, then press Enter.
10. Press F4 or ESC 4 to display the Device Names menu.
11. Select the adapter from which you are removing the cables or devices in the Device Names menu.
12. In the Keep Definition field, use the tab key to answer Yes.
13. In the Unconfigure Child Devices field, use the Tab key to answer Yes, then press Enter. The ARE YOU SURE screen displays.
14. Press Enter to verify the information. A successful deconfiguration is indicated by the "OK" message displayed next to the Command field at the top of the screen.
15. Press F4 or ESC 4 twice to return to the Hot Plug Manager menu.
16. Select replace/remove PCI Hot Plug adapter.
17. Select the slot that has the adapter you want to remove the cables or devices from in the system.
18. Select **Remove**.

Note: A fast blinking amber LED located at the back of the machine indicates the slot that you selected.

19. Press Enter. This places the adapter in the "action" state, meaning it is ready to be removed from the system. (You do not need to remove the adapter, unless it makes removing the cables attached to it easier).

After hot-plug SCSI device or cable deconfiguration

Use this procedure after you deconfigure or hot-plug a SCSI device to ensure that the replaced component was successfully installed.

1. Press Enter, then continue to follow the screen instructions until you receive a message that the replacement is successful. A successful replacement is indicated by the OK message displayed next to the command field at the top of the screen.
2. Press the F3 or ESC 3 key to return to the **PCI Hot-Plug Manager** menu.
3. Press the F3 or ESC 3 key to return to the **TASK** selection list.
4. Select **Log Repair Action**.
5. Select the adapter you just removed the cables or devices from, then press Enter.
6. Press Commit (F7 or ESC 7), then press Enter.
7. Press the F10 or the ESC 0 key to exit diagnostics.
8. Type the **diag -a** command on the command line.

MAP 0054: PCI-X SCSI Bus Problems

Use this MAP to determine which FRUs may need to be replaced in order to solve a SCSI bus-related problem on a PCI-X SCSI or PCI-X SCSI RAID adapter.

Purpose of This MAP

Use the following to determine which FRUs may need to be replaced in order to solve a SCSI bus-related problem on a PCI-X SCSI or PCI-X SCSI RAID adapter.

Considerations

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Note that some systems have SCSI and PCI-X bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these SCSI and PCI-X buses. An example of such a RAID enablement card is FC 5709. For these configurations, replacement of the RAID enablement card is unlikely to solve a SCSI bus-related problem, because the SCSI bus interface logic is on the system board.
- Some adapters provide two connectors, one internal and one external, for each SCSI bus. For this type of adapter, it is not acceptable to use both connectors for the same SCSI bus at the same time. SCSI bus problems are likely to occur if this is done. However, it is acceptable to use an internal connector for one SCSI bus and an external connector for another SCSI bus. The internal and external connectors are labeled to indicate which SCSI bus they correspond to.

Attention: RAID adapters should not be replaced when SCSI bus problems exist, except with assistance from your service support structure. Because the adapter may contain non-volatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter when SCSI bus problems exist.

Attention: Do not remove functioning disks in a disk array without assistance from your service support structure. A disk array may become degraded or failed if functioning disks are removed, and additional problems may be created.

Follow the steps in this MAP to isolate a PCI-X SCSI bus problem.

• Step 0054-1

Identify the SCSI bus on which the problem is occurring on by examining the hardware error log. To view the hardware error log, do the following:

1. Invoke diagnostics and select **Task Selection** on the Function Selection screen.
2. Select **Display Hardware Error Report**.
3. Choose one of the following options:
 - If the type of adapter is not known, select **Display Hardware Errors for Any Resource**.
 - If the adapter is a PCI-X SCSI adapter, select **Display Hardware Errors for PCI-X SCSI Adapters**.
 - If the adapter is a PCI-X SCSI RAID adapter, select **Display Hardware Errors for PCI-X SCSI RAID Adapters**.
4. Select the resource, or select **All Resources** if the resource is not known. If you had previously selected **Display Hardware Errors for Any Resource**, then select **All Resources**.
5. On the Error Summary screen, look for an entry with a SRN corresponding to the problem which sent you here, and select it.

Note: If multiple entries exist for the SRN, some entries might be old or the problem has occurred on multiple entities (adapters, disk arrays, or devices). Older entries can be ignored; however, this MAP may need to be used multiple times if the same problem has occurred on multiple entities.

6. Select the hardware error log to view.

While viewing the hardware error log, under the Detail Data and SENSE DATA headings, identify the first four bytes of the hexadecimal data (for example, nnnn nnnn nnnn nnnn ...). The four bytes identified in the error log can be interpreted as:

00bb ssLL

where:

- bb, when not FF, identifies the adapter's SCSI bus
- ss, when not FF, identifies the SCSI ID of a device
- LL, when not FF, identifies the logical unit number (LUN) of a device

Go to Step 0540-2.

• **Step 0054-2**

Are the last two bytes of the four bytes identified in Step 0540-1, equal to FFFF (for example, 00bb FFFF, where bb identifies the adapter's SCSI bus)?

NO Go to Step 0540-4.

YES Go to Step 0540-3.

• **Step 0054-3**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Cable on bus bb (if present)
2. Adapter (if SCSI bus interface logic is on the adapter) or system board (if SCSI bus interface logic is on the system board)

To replace a component, and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to Chapter 5, "Verifying a repair," on page 611.

• **Step 0054-4**

Are the last two bytes of the four bytes identified in Step 0540-1, equal to FF00 (for example, 00bb FF00, where bb identifies the adapter's SCSI bus)?

NO Go to Step 0540-6.

YES Go to Step 0540-5.

• **Step 0054-5**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Cable on bus bb (if present)
2. Adapter (if SCSI bus interface logic is on the adapter) or system board (if the SCSI bus interface logic is on the system board)
3. DASD backplane attached to bus bb (if present)

To replace a component, and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to Chapter 5, "Verifying a repair," on page 611.

• **Step 0054-6**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Device on bus bb with SCSI ID ss
2. Cable on bus bb (if present)
3. Adapter (if SCSI bus interface logic is on the adapter) or system board (if SCSI bus interface logic is on the system board)

To replace a component and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to Chapter 5, "Verifying a repair," on page 611.

MAP 0070: 888 sequence in operator panel display

Use this MAP when you receive an 888 sequence on the operator panel display or monitor.

Purpose of this MAP

An 888 sequence in operator panel display suggests that either a hardware or software problem has been detected and a diagnostic message is ready to be read.

Note: The 888 may or may not be flashing on the operator panel display.

- **Step 0070-1**

Perform the following steps to record the information contained in the 888 sequence message.

1. Wait until the 888 sequence displays.
2. Record, in sequence, every code displayed after the 888. On systems with a 3-digit or a 4-digit operator panel, you may need to press the system's "reset" button to view the additional digits after the 888. Stop recording when the 888 digits reappear.
3. Go to Step 0070-2.

- **Step 0070-2**

Using the first code that you recorded, use the following list to determine the next step to use.

Type 102

Go to Step 0070-3.

Type 103

Go to Step 0070-4.

- **Step 0070-3**

A Type 102 message generates when a software or hardware error occurs during system execution of an application. Use the following information to determine the content of the type 102 message.

The message readout sequence is:

102 = Message type RRR = Crash code (the three-digit code that immediately follows the 102) SSS = Dump status code (the three-digit code that immediately follows the Crash code).

Record the crash code and the dump status from the message you recorded in Step 0070-1.

Are there additional codes following the dump status?

No Go to Step 0070-5.

YES The message also has a type 103 message included in it. Go to Step 0070-4 to decipher the SRN and field replaceable unit (FRU) information in the Type 103 message.

Note: Type 102 messages have no associated SRNs.

- **Step 0070-4**

A type 103 message is generated by the hardware when certain types of hardware errors are detected. Use the following steps and information you recorded in Step 0070-1 to determine the content of the Type 103 message.

The message readout sequence is:

103 = Message type (x)xxx (y)yyy = SRN (where (x)xxx = the three- or four-digit code following the 103 and (y)yyy is the three- or four-digit code following the (x)xxx code).

1. Record the SRN and FRU location codes from the recorded message.
2. Find the SRN in the Service Request Number List and do the indicated action.

Note: The only way to recover from an 888 type of halt is to turn off the system unit.

• **Step 0070-5**

Perform the following steps:

1. Turn off the system unit power.
2. Turn on the system unit power, and load the online diagnostics in service mode.
3. Wait until one of the following conditions occurs:
 - You are able to load the diagnostics to the point where the Diagnostic Mode Selection menu displays.
 - The system stops with an 888 sequence.
 - The system appears hung.

Is the Diagnostic Mode Selection menu displayed?

No Perform problem analysis.

Yes Go to Step 0070-6.

• **Step 0070-6**

Run the **All Resources** options under Advanced Diagnostics in Problem Determination Mode.

Was an SRN reported by the diagnostics?

No This is possibly a software-related 888 sequence. Follow the procedure for reporting a software problem.

Yes Record the SRN and its location code information. Find the SRN in the SRN Listing and do the indicated action.

MAP 0230: Platform error problem resolution

Use this MAP to resolve problems reported by SRNs A00-xxx to A25-xxxx.

Step 0230-1

1. The last character of the SRN is bit-encoded as follows:

8	4	2	1	
|	|	|		Replace all FRUs listed
|	|			Hot-swap is supported
|				Software or Firmware could be the cause
				Reserved

2. Refer to the last character in the SRN. A 4, 5, 6, or 7 indicates a possible software or firmware problem.

Does the last character indicate a possible software or firmware problem?

NO Go to Step 0230-4

YES Go to Step 0230-2.

Step 0230-2

Ask the customer if any software or firmware has been installed recently.

Has any software or firmware been installed recently?

NO Go to Step 0230-4.

YES Go to Step 0230-3.

Step 0230-3

Suspect the new software or firmware.

Check with your support center for any known problems with the new software or firmware.

Are there any known problems with the software or firmware?

NO Go to Step 0230-4.

YES Obtain and follow the procedure to correct the software problem. This completes the repair.

Step 0230-4

Were any FRUs or location code reported with the SRN?

NO Go to Step 0230-5.

YES Go to Step 0230-9

Step 0230-5

Run the diagnostics in problem determination mode on **sysplanar0**.

Were there any FRUs reported with the SRN?

NO Go to Step 0230-6.

YES Go to Step 0230-9

Step 0230-6

Did the system display: "Previous Diagnostic Results - Do you want to review the previously displayed error?"

NO Go to Step 0230-7.

YES You have a pending item in the error log for which there is no corresponding log repair action. To see this error, select **YES** at the prompt. Information from the error log displays in order of last event first. Record the error code, the FRU names and the location code of the FRUs. Go to Step 0230-7

Step 0230-7

Were there any other SRNs that begin with an A00 to A1F reported?

NO Go to Step 0230-8.

YES Go to Step 0230-1 and use the new SRN.

Step 0230-8

Attempt to boot the system on slow boot mode.

If the system boots, run the diagnostics in problem determination mode on **sysplanar0**

Were any new error codes or SRNs reported?

NO Call your support center.

YES Follow the procedure for the new error code or SRN.

Step 0230-9

1. Obtain the list of physical location codes and FRU numbers that were listed on the Problem Report Screen. The list can be obtained by running the `sysplanar0` diagnostics or using the **Display Previous Diagnostic Results** task.
2. Record the physical location codes and FRU numbers.
3. Refer to the last character in the SRN. A 2, 3, 6, or 7 indicates that hot-swap is possible.

Does the last character indicate that hot-swap is possible?

NO Go to Step 0230-10.

YES Go to Step 0230-14

Step 0230-10

Note: If necessary, refer to the section under "Reference Information" in the system service guide "Powering the system on and off" for information on system shut down and powering the system on and off.

1. If the operating system is running, perform the operating system's shutdown procedure.
2. Turn off power to the system.
3. Refer to the last character in the SRN. A 1, 3, 5, or 7 indicates that all FRUs listed on the Problem Report Screen need to be replaced. For SRNs ending with any other character, exchange one FRU at a time, in the order listed.

Note: Use the appropriate procedure under "Removal and Replacement Procedures" in the system service guide to replace any FRUs indicated.

4. Turn on power to the system.
5. Load Online Diagnostics in service mode (see the system's service guide if needed).

Note: If the Diagnostics Operating Instructions do not display or you are unable to select the **Task Selection** option, check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020: Problem determination procedure" on page 285 and get a new SRN.

6. Wait until the **Diagnostics Operating Instructions** are displayed or the system appears to stop.
7. Press Enter.
8. Select **Diagnostic Routines** at the function selection menu.
9. Select **System Verification**.
10. If a missing options exist, particularly if it is related to the device that was replaced, resolve the missing options before proceeding
11. Select the **Task Selection** option.
12. Select the **Log Repair Action** option.
13. Log a repair action for each replaced resource.
14. If the resource associated with your repair action is not displayed on the resource list, select **sysplanar0**.

15. Return to the Task Selection Menu.
16. If the FRU that was replaced was memory and the system is running as a full system partition, select **Run Exercisers** and run the short exerciser on all the resources, otherwise proceed to Step 0230-15.
17. If you ran the exercisers in Step 0230-10, substep 16, return to the Task Selection menu.
18. Select **Run Error Log Analysis** and run analysis on all the resources.

Was a problem reported?

NO The repair is complete. Go to Chapter 5, "Verifying a repair," on page 611.

YES Go to Step 0230-11.

Step 0230-11

Is the problem the same as the original problem?

NO The symptom has changed. Check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020: Problem determination procedure" on page 285 and get a new SRN.

YES Go to Step 0230-12.

Step 0230-12

Look at the physical location codes and FRU part numbers you recorded.

Have you exchanged all the FRUs that were listed?

NO Go to Step 0230-13.

YES The SRN did not identify the failing FRU. Call your support person for assistance.

Step 0230-13

1. After performing a shutdown of the operating system, turn off power to the system.
2. Remove the new FRU and install the original FRU.
3. Exchange the next FRU in list.
4. Turn on power to the system.
5. Load Online Diagnostics in service mode (see the system's service guide if needed).

Note: If the Diagnostics Operating Instructions do not display or you are unable to select the **Task Selection** option, check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020: Problem determination procedure" on page 285 and get a new SRN.

6. Wait until the Diagnostics Operating Instructions are displayed or the system appears to stop.
7. Press Enter.
8. Select **Diagnostic Routines** at the function selection menu.
9. Select **System Verification**.
10. If a missing options exist, particularly if it is related to the device that was replaced, resolve the missing options before proceeding
11. Select the **Task Selection** option.
12. Select the **Log Repair Action** option.
13. Log a repair action for each replaced resource.
14. If the resource associated with your action does not appear on the Resource List, select **sysplanar0**.
15. Return to the Task Selection Menu.

16. If the FRU that was replaced was memory and the system is running as a full system partition, select **Run Exercisers** and run the short exerciser on all the resources, otherwise proceed to Step 0230-15.
17. If you ran the exercisers in Step 0230-13, substep 16, return to the Task Selection menu.
18. Select **Run Error Log Analysis** and run analysis on all the resources.

Was a problem reported?

NO The repair is complete. Go to Chapter 5, "Verifying a repair," on page 611.

YES Go to Step 0230-11.

Step 0230-14

The FRUs can be hot-swapped. If you do not want to use the hot-swap, go to Step 0230-10.

Note: See the hot-swap procedures in the "Removal and Replacement" section of your system unit's service guide.

1. Refer to the last character in the SRN. A 1, 3, 5, or 7 indicates that all FRUs listed on the Problem Report Screen must be replaced. For SRNs ending with any other character, exchange one FRU at a time, in the order listed.
2. If available, use the CE Login and enter the **diag** command.

Note: If CE Login is not available, have the system administrator enter superuser mode and then enter the **diag** command.

3. After the Diagnostics Operating Instructions display, press Enter.
4. Select the **Task Selection** option.
5. Select the **Log Repair Action** option.
6. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.
7. Log a repair action for each replaced resource.
8. Return to the Task Selection menu.
9. For systems running as a full system partition, select **Run Exercisers** and run the short exerciser on all resources.
10. Use the **Log Repair Action** option in the Task Selection menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with your repair action. If it is not displayed on the resource list, select **sysplanar0**.

Note: On systems with a Fault Indicator LED, this changes the Fault Indicator LED from the "fault" state to the "normal" state.

Was a problem reported?

NO The repair is complete. Return the system to the customer.

YES Go to Step 0230-15.

Step 0230-15

Is the problem the same as the original problem?

NO The symptom has changed. Check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020: Problem determination procedure" on page 285 and get a new SRN.

YES Go to Step 0230-16.

Step 0230-16

Look at the physical location codes and FRU part numbers you recorded.

Have you exchanged all the FRUs that were listed?

NO Go to Step 0230-17.

YES The SRN did not identify the failing FRU. Call your support person for assistance.

Step 0230-17

1. Remove the new FRU and install the original FRU.
2. Exchange the next FRU in the list.
3. Return to the Task Selection Menu.
4. Select the **Log Repair Action** option.
5. Log a repair action for each replaced resource.
6. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.
7. Return to the Task Selection Menu.
8. For systems running as a full system partition select **Run Exercisers** and run the short exerciser on all resources.
9. If you ran the exercisers in substep Step 0230-17, substep 8.
10. Select **Run Error Log Analysis** and run analysis on all exchanged resources.

Was a problem reported?

NO The repair is complete. Return the system to the customer.

YES Go to Step 0230-15.

MAP 0260: System hangs during resource configuration

Use this MAP when the system unit hangs while configuring a resource.

Purpose of this MAP

This MAP handles problems when the system unit hangs while configuring a resource.

- **Step 0260-1**

The last three or four digits of the SRN following the dash (-) match a failing function code number.

Look at the Chapter 8, "Part Information," on page 741 and find the failing function code that matches the last three or four digits of your SRN, following the dash. Record the FRU part number and description (use the first FRU part listed when multiple FRUs are listed).

The physical location code, AIX location code, or device name is displayed on the operator panel.

Do you have either a physical location code or AIX location code displayed?

No Go to Step 0260-4.

Yes Go to Step 0260-2.

- **Step 0260-2**

Are there any FRUs attached to the device described by the physical location code or AIX location code?

No Go to Step 0260-6.

Yes Go to Step 0260-3.

- **Step 0260-3**

Remove this kind of FRU attached to the device described in the location code one at a time. Note whether the system still hangs after each device is removed. Do this until you no longer get a hang, or all attached FRUS have been removed from the adapter or device.

Has the symptom changed?

No Go to Step 0260-4.

Yes Use the location code of the attached device that you removed when the symptom changed, and go to Step 0260-6.

- **Step 0260-4**

Does your system unit contain only one of this kind of FRU?

No Go to Step 0260-5.

Yes Go to Step 0260-6.

- **Step 0260-5**

One of the FRUs of this kind is defective.

Remove this kind of FRU one at a time. Test the system unit after each FRU is removed. Stop when the test completes successfully or when you have removed all of the FRUs of this kind.

Were you able to identify a failing FRU?

No Go to “PFW1540: Problem isolation procedures” on page 322.

Yes Go to Step 0260-6.

- **Step 0260-6**

1. Turn off the system unit.
2. Exchange the FRU identified by the location code or Step 0260-5.

Is this system capable of running online diagnostics in service mode?

No Go to Step 02607.

Yes Go to Step 02608.

- **Step 0260-7**

1. Turn on the system unit.
2. Load the standalone diagnostics and refer to “Running the online and eServer stand-alone diagnostics” on page 729.
3. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.

Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?

NO Go to Step 02609.

YES Go to Chapter 5, “Verifying a repair,” on page 611.

- **Step 0260-8**

1. Turn on the system unit.
2. Load the standalone diagnostics and refer to “Running the online and eServer stand-alone diagnostics” on page 729.
3. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.

Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?

NO Go to Step 0260-9.

YES Go to Chapter 5, “Verifying a repair,” on page 611.

- **Step 0260-9**

Look at the operator panel display.

Is the number displayed the same as the last three or four digits after the dash (-) of your SRN?

NO The symptom changed. Check for loose cards, cables, and obvious problems. If you do not find a problem, go to “MAP 0020: Problem determination procedure” on page 285 and get a new SRN.

YES Go to Step 0260-10.

- **Step 0260-10**

Was the FRU you exchanged an adapter or a planar?

NO Go to Step 0260-11.

YES Go to “PFW1540: Problem isolation procedures” on page 322.

- **Step 0260-11**

Was the FRU you exchanged a device?

NO Go to.

YES Go to Step 0260-12.

- **Step 0260-12**

The adapter for the device may be causing the problem.

1. Turn off the system unit.
2. Exchange the adapter for the device.

Note: If the AIX operating system is not used on the system, start diagnostics from an alternate source.

3. Turn on the system unit. If c31 is displayed, follow the instructions to select a console display.
4. Load the standalone diagnostics and refer to “Running the online and eServer stand-alone diagnostics” on page 729.
5. Wait until the DIAGNOSTIC OPERATING INSTRUCTIONS display or the system appears to have stopped.

Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?

NO Go to “PFW1540: Problem isolation procedures” on page 322.

YES Go to Chapter 5, “Verifying a repair,” on page 611.

MAP 0270: SCSI RAID problem resolution and verification

Use this MAP to resolve SCSI RAID adapter, cache, or drive problems.

Purpose of This MAP

Use this MAP to resolve SCSI RAID adapter, cache, or drive problems.

Notes:

1. This MAP assumes that the RAID adapter and drive microcode is at the correct level.
2. This MAP only applies to PCI, not PCI-X, RAID adapters.

Attention: If the FRU is a disk drive or an adapter, ask the system administrator to perform the steps necessary to prepare the device for removal.

- **Step 0270-1**

1. If the system displayed a FRU part number on the screen, use that part number. If there is no FRU part number displayed on the screen, refer to the SRN listing. Record the SRN source code and the failing function codes in the order listed.
2. Find the failing function codes in the FFC listing, and record the FRU part number and description of each FRU.

Go to Step 0270-2.

- **Step 0270-2**

Is the FRU a RAID drive?

NO Go to Step 0270-6.

YES Go to Step 0270-3.

- **Step 0270-3**

If the RAID drive you want to replace is not already in the **failed** state, then ask the customer to run the **PCI SCSI Disk Array Manager** using **smit** to fail the drive that you wish to replace. An example of this procedure is:

1. Login as root.
2. Type **smit pdam**.
3. Select **Fail a Drive in a PCI SCSI Disk Array**.
4. Select the appropriate disk array by placing the cursor over that array and press Enter.
5. Select the appropriate drive to fail based on the Channel and ID called out in diagnostics.
6. The **Fail a Drive** screen will appear. Verify that you are failing the correct drive by looking at the Channel ID row. Press Enter when verified correct. Press Enter again.
7. Press **F10** and type **smit pdam**
8. Select **"Change/Show PCI SCSI RAID Drive Status → Remove a Failed Drive**
9. Select the drive that just failed.

Go to Step 0270-4.

- **Step 0270-4**

Replace the RAID drive using the RAID HOT PLUG DEVICES service aid:

Note: The drive you wish to replace must be either a SPARE or FAILED drive. Otherwise, the drive would not be listed as an IDENTIFY AND REMOVE RESOURCES selection within the RAID HOT PLUG DEVICES screen. In that case you must ask the customer to put the drive into FAILED state. For information on putting the drive in a FAILED state, refer the customer to the *PCI Dual Channel Ultra320 SCSI RAID Adapter Installation and Using Guide*, order number SC23-1324.

1. Select the RAID HOT PLUG DEVICES option within the HOT PLUG TASK under DIAGNOSTIC SERVICE AIDS.
2. Select the RAID adapter that is connected to the RAID array containing the RAID drive you wish to remove, then select COMMIT.
3. Choose the IDENTIFY option in the IDENTIFY AND REMOVE RESOURCES menu.
4. Select the physical disk which you wish to remove from the RAID array and press Enter.
5. The disk will go into the IDENTIFY state, indicated by a flashing light on the drive. Verify that it is the physical drive you wish to remove, then press Enter.
6. At the IDENTIFY AND REMOVE RESOURCES menu, choose the REMOVE option and press Enter.
7. A list of the physical disks in the system which may be removed will be displayed. If the physical disk you wish to remove is listed, select it and press Enter. The physical disk will go into the REMOVE state, as indicted by the LED on the drive. If the physical disk you wish to remove is not listed, it is not a SPARE or FAILED drive. Ask the customer to put the drive in the FAILED state before you can proceed to remove it. For information on putting the drive in a FAILED state, refer the customer to the *PCI Dual Channel Ultra320 SCSI RAID Adapter Installation and Using Guide*, order number SC23-1324.
8. Refer to service guide for the system unit or enclosure that contains the physical drive for removal and replacement procedures for the following substeps:
 - a. Remove the old hot-swap RAID drive.
 - b. Install the new hot-swap RAID drive. Once the hot-swap drive is in place, press Enter. The drive will exit the REMOVE state, and will go to the NORMAL state once you exit diagnostics.

Note: There are no elective tests to run on a RAID drive itself under diagnostics (the drives are tested by the RAID adapter).

Go to Step 0270-5.

- **Step 0270-5**

If the RAID did not begin reconstructing automatically, perform the steps that follow.

Adding a Disk to the RAID array and Reconstructing:

Ask the customer to run the PCI SCSI Disk Array Manager using **smit**. An example of this procedure is:

1. Login as root.
2. Type **smit pdam**.
3. Select **Change/Show PCI SCSI RAID Drive Status**.
4. Select **Add a Spare Drive**.
5. Select the appropriate adapter.
6. Select the channel and ID of the drive which was replaced.
7. Press Enter when verified.
8. Press **F3** until you are back at the **Change/Show PCI SCSI RAID Drive Status** screen.
9. Select **Add a Hot Spare**.
10. Select the drive you just added as a spare.
11. If there was no hot spare previously installed in the array, the array will begin reconstructing immediately. Reconstruction time will vary based on the size of the RAID array. Allow 1-2 hours for completion.

To check the progress of the reconstruction:

1. Login as root.
2. Type **smit pdam**.
3. Select **List PCI SCSI RAID Arrays**.
4. Choose the array containing the drive you replaced.
If the state of the RAID array is reconstructing then it is in process of reconstructing. If it is optimal, then reconstruction has completed.
5. Press **F10** to exit.

Go to Step 027017.

- **Step 0270-6**

Is the FRU a RAID adapter base card, RAID adapter cache card, or RAID adapter battery?

NO Go to Step 0270-15.

YES Go to Step 0270-7.

- **Step 0270-7**

Do you want to change the FRU using a hot-swap operation?

NO Power down the system, and remove the RAID adapter. Go to Step 0270-8.

YES Remove the RAID adapter. Go to Step 0270-8.

- **Step 0270-8**

Is the FRU you want to replace a RAID adapter cache card or RAID adapter battery?

NO Go to Step 0270-10.

YES Go to Step 0270-9.

- **Step 0270-9**

Replace the FRU onto the existing base card.

Go to Step 0270-11.

- **Step 0270-10**

After physically removing the base card from the system, remove any other good FRUs (RAID cache card or cache battery) from the RAID base card adapter. Plug these FRUs on to the replacement RAID base card adapter FRU.

Go to Step 0270-11.

- **Step 0270-11**

Did you change the FRU using a hot-swap operation?

NO Install the RAID adapter assembly into the system. Power up the system and login to AIX. Go to Step 0270-12.

YES Install the RAID adapter assembly into the system. Go to Step 0270-12.

- **Step 0270-12**

Was the replacement FRU a RAID base card?

NO Go to Step 0270-14.

YES Go to Step 0270-13.

- **Step 0270-13**

Attention: Prior to cabling the SCSI RAID adapter to the subsystem check for preexisting configurations on the replacement SCSI RAID base card. The replacement base card can overwrite your system's configuration data if it already has a configuration written to it! Check it before cabling the SCSI RAID subsystem array.

Ask to customer to check for preexisting configuration on the SCSI RAID base card. Below is an example of this procedure:

1. Login as root (if not already root).
2. Type `smit pdam`.
3. Select **List PCI SCSI RAID Arrays**.
4. If no RAID arrays are listed, then there are no preexisting configurations on the base card.
5. Press **F10** key to exit.

If a preexisting configuration exists on the base card, ask the customer to run the PCI SCSI Disk Array Manager using **smitty**.

1. Login as root (if not already root).
2. Type `smit pdam` from the AIX command prompt (if not already in the RAID manager).
3. Select **Recovery Options**.
4. Select **Clear PCI SCSI RAID Adapter Configuration**. Select the adapter which you just installed. Press Enter to confirm.
5. Return to the **Recovery Options** menu (if not already there). Select **Resolve PCI SCSI RAID Adapter Configuration**. Select **Accept Configuration on Drives**. Select the adapter which you just installed. Press Enter to confirm. The configuration on the new adapter should now match the configuration existent on the drives.
6. Press **F10** to exit.

You may now proceed to cable the RAID system array.

Go to Step 0270-16.

- **Step 0270-14**

Ask the customer to resynchronize the RAID array configuration. Below is an example of this procedure:

1. Log in as root (if not already root).
2. Type `smit pdam`.
3. Select **Recovery Options**.
4. Select **Resolve PCI SCSI RAID Adapter Configuration**.

5. Select **Retry Current Configuration**.
6. Select the appropriate **scraid** (SCSI RAID) adapter.
7. A message will be displayed as to the success of the operation.
8. Press **F10** to exit.

Go to Step 0270-16.

- **Step 0270-15**

Other RAID FRUs require that the system be shut down prior to replacement.

1. If the operating system is running, perform the operating system shutdown procedure (get help if needed).
2. Turn off the system power.
3. Replace the FRU indicated by the FFC.

Go to Step 0270-16.

- **Step 0270-16**

Run the diagnostics in system verification mode on the RAID subsystem.

Did the diagnostics run with no trouble found?

NO Go to Step 0270-18.

YES Go to Step 0270-17.

- **Step 0270-17**

1. Use the **Log Repair Action** option in the TASK SELECTION menu to update the AIX error log. Select **scraidX** (where X is the RAID adapter number of the RAID subsystem you've been working on).

Note: On systems with fault indicator LED, this changes the fault indicator LED from the **Fault** state to the **Normal** state.

2. While in diagnostics, go to the FUNCTION SELECTION menu. Select the **Advanced Diagnostics Routines** option.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the system verification option. Run the diagnostic test on **scraidX** (where X is the RAID adapter number).

Did the diagnostics run with no trouble found?

NO Go to the Step 0270-18.

YES If you changed the service processor or network settings, restore the settings to the value they had prior to servicing the system. .

This completes the repair; return the system to the customer. Go to the closing a service call procedure to finalize the repair.

- **Step 0270-18**

Have you exchanged all the FRUs that correspond to the failing function codes?

NO Go to Step 0270-19.

YES The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to "MAP 0030: Additional Problem Determination" on page 292.

- **Step 0270-19**

Note: Note: Before proceeding, remove the FRU you just replaced and install the original FRU in its place.

Use the next FRU on the list and go to Step 0270-2.

MAP 0280: Console and Keyboard Problem Resolution

Use this MAP to resolve console and keyboard problems when the system is booting.

Purpose of This MAP

Use this MAP to resolve console and keyboard problems when the system is booting. For other boot problems and concerns, go to “Problems with loading and starting the operating system (AIX and Linux)” on page 268.

Entry Table	
Entry 1	Go to Step 0280-1.
Entry 2	Go to Step 0280-2.
Entry 3	Go to Step 0280-3.

- **Step 0280-1**

The system fails to respond to keyboard entries.

This problem is most likely caused by a faulty keyboard, keyboard adapter, or keyboard cable.

Try the FRUs in the order listed below: (Test each FRU by retrying the failing operation.)

1. Keyboard
2. Keyboard adapter (normally located on the system board)
3. Keyboard cable (if not included with the keyboard)

Were you able to resolve the problem?

NO Go to “MAP 0030: Additional Problem Determination” on page 292.

YES Go to Chapter 5, “Verifying a repair,” on page 611.

- **Step 0280-2**

1. Some systems have a graphic adapter POST. If a graphic adapter POST is supported and it indicates a failure, follow the procedures in the system guide to resolve the problem.
2. If a graphic adapter POST is supported and it does not indicate a failure, suspect the display or display cable.
3. If the system does not have a graphic adapter POST, go to the display’s problem determination procedures. If you do not find a problem, replace the graphics adapter.

Were you able to resolve the problem?

NO Go to “MAP 0030: Additional Problem Determination” on page 292.

YES Go to Chapter 5, “Verifying a repair,” on page 611.

- **Step 0280-3**

Go to the problem determination procedure for the terminal. If you do not find a problem, suspect the serial port adapter or terminal cable.

Were you able to resolve the problem?

NO Call your support person.

YES Go to Chapter 5, “Verifying a repair,” on page 611.

MAP 0285: Multipath I/O (MPIO) Problem Resolution

Use this MAP to handle SRN A23-001 and ssss-640 (where ssss is the 3 or 4 digit Failing Function Code (FFC) of an SCSD drive) to check the path from adapter to device.

Purpose of this MAP

Use this MAP to handle SRN A23-001 and ssss-640 (where ssss is the 3 or 4 digit FFC of an SCSD drive) to check the path from adapter to device.

Note: Not all devices support MPIO. Before proceeding with this MAP, make sure that the devices on both ends of the missing path support MPIO.

- **Step 0285-1**

Look at the problem report screen for the missing path. After the resource name and FRU, the next column identifies the missing path between resources (for example, scsi0 -> hdisk1). This indicates the missing path between the two resources, scsi0 (the parent resource) and hdisk1 (the child resource).

Is the cabling present between the two resources?

NO Go to Step 0285-2.

YES Go to Step 0285-4.

Note: In the following MAP steps, if no path previously existed between a parent and child device, the child device will have to be changed from the defined to the available state, otherwise you will be unable to select the child device to which you want to establish a path.

- **Step 0285-2**

1. Power off the system.
2. Connect the correct cable between the two resources.
3. Power on the system, rebooting AIX.
4. At the AIX command line, type `smitty mpio`.
5. Choose **MPIO Path Management**.
6. Select **Enable Paths**.
7. Select **Enable Paths for a Device**.
8. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
9. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
10. Press Enter.

Did the smitty menu complete with no errors?

NO Go to Step 0285-4.

YES Go to Step 0285-3.

- **Step 0285-3**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

Do you still have a path problem?

NO Go to Chapter 5, "Verifying a repair," on page 611.

YES Go to Step 0285-4.

- **Step 0285-4**

1. Power off the system.
2. Reseat the cables between the device and the adapter that have the missing path.
3. Power on the system, and reboot AIX.

4. At the AIX command line, type `smitty mpio`.
5. Choose **MPIO Path Management**.
6. Select **Enable Paths**.
7. Select **Enable Paths for a Device**.
8. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
9. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
10. Press Enter.

Did the smitty menu complete with no errors?

NO Go to Step 0285-6.

YES Go to Step 0285-5.

- **Step 0285-5**

To verify that the device path is present, rerun `diag -a`

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

Do you still have a path problem?

NO Go to Chapter 5, "Verifying a repair," on page 611.

YES Go to Step 0285-6.

- **Step 0285-6**

You may have a problem with the driver interface or connector on either the parent or child device.

1. Power off the system (refer to the system service guide if necessary).
2. Remove the cables to the parent device.
3. Replace the cable(s) that go between the parent and child device (if present).
4. Reattach the cables to the parent device.
5. Power on the system, rebooting AIX (refer to the system service guide if necessary).
6. At the AIX command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press Enter.

Did the smitty menu complete with no errors?

NO Go to Step 0285-7.

YES Go to Step 0285-8.

- **Step 0285-7**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If the letter P is not shown in front of the resource, or if the system returns to the command prompt, or you get a message without the resource list being displayed, then the problem has been resolved.

Do you still have a problem?

NO Go to Chapter 5, “Verifying a repair,” on page 611.

YES Go to Step 0285-8.

- **Step 0285-8**

You may have a problem with the driver interface or connector on either the parent or child device.

1. Power off the system.
2. Remove the cables to the parent device.
3. Replace the parent device.
4. Reattach the cables to the parent device.
5. Power on the system, rebooting AIX.
6. At the AIX command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press Enter.

Did the smitty menu complete with no errors?

NO Go to Step 0285-9.

YES Go to Step 0285-10.

- **Step 0285-9**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

Do you still have a path problem?

NO Go to Chapter 5, “Verifying a repair,” on page 611.

YES Go to Step 0285-10.

- **Step 0285-10**

You may have a problem with the driver interface or connector on the child device.

1. Power off the system.
2. Remove the cables to the child device.
3. Replace the child device (in the case of a SCSI or SAF-TE backplane, replace the backplane first, followed by the child device).
4. Reattach the cables to the child device.
5. Power on the system, rebooting AIX.
6. At the AIX command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press Enter.

Did the smitty menu complete with no errors?

NO Neither the cabling, nor the parent, nor the child seem to be causing the problem. Contact your service support structure.

YES Go to Step 0285-11.

- **Step 0285-11**

Rerun diag -a to verify that the device path is present.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

Do you still have a path problem?

NO Go to Chapter 5, "Verifying a repair," on page 611.

YES Neither the cabling, nor the parent, nor the child seem to be causing the problem. Contact your service support structure.

MAP 0291: Missing Device or Bus Problem Resolution

Use this MAP when a bus or device (such as a disk drive) is reported as a missing resource by the diagnostics.

Purpose of this MAP

Use this MAP when a bus or device (such as a disk drive) is reported as a missing resource by the diagnostics.

- **Step 0291-1**

The device may be missing because of a power problem.

If the missing device is located in a drawer or enclosure, do the following:

1. Check for any environmental problem indicators such as power or cooling that may indicate a problem. (if needed, refer to the service documentation.)
2. If a problem is indicated, follow the service documentation to resolve the problem.

Go to Step 0291-2.

- **Step 0291-2**

Inspect the cables (signal and power) of the missing device. Be sure all connections are in place and power is present. Refer to the system or enclosure documentation containing the power wiring diagram or system cable diagram to locate specific cables, determine the cable numbering, and check for a problem-determination procedure. Look for obvious power cabling problems, such as missing or loose cable connectors.

Power problems can sometimes be identified by checking other devices that use the same power source (such as a diskette drive and a SCSI tape drive, even though they have different controllers). If other devices that share a power source are reported as missing devices, suspect the power source as the problem.

If there is a power problem, refer to "Power problems" on page 142.

Did you find a problem?

NO Go to Step 0291-3.

YES Correct the problem, then go to Chapter 5, "Verifying a repair," on page 611.

- **Step 0291-3**

Is the missing device a SCSI device installed in a SCSI Enclosure Services (AIX resource SESx) or SAF-TE (AIX resource SAFTEEx), or a SCSI device installed in either type of enclosure?

NO Go to "General problem resolution" on page 268.

YES Go to Step 0291-4.

- **Step 0291-4**

Run the advanced diagnostics in problem determination mode on the SCSI Enclosure Services or SAF-TE device.

Note: A no trouble found result, or if you get another SRN with the same digits before the dash as you previously had from the diagnostics, indicates that you did NOT get a different SRN.

Did you get a different SRN than when you ran the diagnostics previously?

NO Go to Step 0291-5.

YES Take the following action:

1. Look up the SRN.

Note: If the SRN is not listed a Service Request Number Lists, look for additional information in the following:

- Any supplemental service manual for the device.
- The diagnostic Problem Report screen.
- The Service Hints service aid in “Running the online and eServer stand-alone diagnostics” on page 729.

2. Perform the action listed.

- **Step 0291-5**

Power off the system. Disconnect all hot-swap devices attached to the adapter. Reconnect the hot-swap devices one at time. After reconnecting each device, do the following:

1. Power on the system and boot the system in the same mode that you were in when you received the symptom that led you to this MAP “Powering on and powering off” on page 641.
2. At an AIX command prompt, run a (**diag -a**) to check for missing options.
3. Verify that the device you just added to the system is present in the system configuration. If other devices are now missing, the problem may be with the last device that was reconnected or reinstalled. Perform these substeps:
 - a. If the device that was just reinstalled in the system is missing, or if additional devices are now missing, replace the last device that was reinstalled.
 - b. Rerun **diag -a** to check for missing options.
 - c. If devices are no longer missing, go to Chapter 5, “Verifying a repair,” on page 611. Otherwise, contact your support center.

Note: A device problem can cause other devices attached to the same SCSI adapter to go into the defined state. Ask the system administrator to make sure that all devices attached to the same SCSI adapter as the device that you replaced are in the available state.

4. If no devices were missing, the problem could be intermittent. Make a record of the problem. Running the diagnostics for each device on the bus may provide additional information. If you have not replaced FFCs B88, 190, and 152 go to “General problem resolution” on page 268, using FFCs (in order): B88, 190, and 152.

PFW1540: Problem isolation procedures

The PFW1540 procedures are used to locate problems in the processor subsystem or I/O subsystem(s).

If a problem is detected, these procedures help you isolate the problem to a failing unit. Find the symptom in the following table; then follow the instructions given in the Action column.

Problem Isolation Procedures	
Symptom/Reference Code/Checkpoint	Action
You have or suspect an I/O card or I/O subsystem failure. You received one of the following SRNs or reference codes: 101-000, 101-517, 101-521, 101-538, 101-551 to 101-557, 101-559 to 101-599, 101-662, 101-727, 101-c32, 101-c33, 101-c70	Go to "PFW1542: I/O problem isolation procedure."
You have or suspect a memory or processor subsystem problem. You received the following SRN or reference code: 101-185	Go to "PFW1548: Memory and processor subsystem problem isolation procedure" on page 336.
If you were directed to the PFW1540 procedure by an SRN and that SRN is not listed in this table.	Go to "PFW1542: I/O problem isolation procedure."

FRU identify LEDs

Your system is configured with an arrangement of LEDs that help identify various components of the system. These include but are not limited to:

- Rack identify beacon LED (optional rack status beacon)
- Processor subsystem drawer identify LED
- I/O drawer identify LED
- RIO port identify LED
- FRU identify LED
- Power subsystem FRUs
- Processor subsystem FRUs
- I/O subsystem FRUs
- I/O adapter identify LED
- DASD identify LED

The identify LEDs are arranged hierarchically with the FRU identify LED at the bottom of the hierarchy, followed by the corresponding processor subsystem or I/O drawer identify LED, and the corresponding rack identify LED to locate the failing FRU more easily. Any identify LED in the system may be flashed; refer to "Managing the Advanced System Management Interface (ASMI)" on page 702.

Any identify LED in the system may also be flashed by using the "Identify and Attention Indicators" task through the AIX diagnostic programs. The procedure to use the Identify and Attention Indicators task in the AIX diagnostics is outlined in "Tasks and Service Aids" in "Running the online and eServer stand-alone diagnostics" on page 729.

PFW1542: I/O problem isolation procedure

This I/O problem-determination procedure isolates I/O card and I/O subsystem failures. When I/O problem isolation is complete, all cables and cards that are failing will have been replaced or reseated.

Notes:

1. To avoid damage to the system or subsystem components, unplug the power cords before removing or installing a part.
2. This procedure assumes that either:
 - An optical drive is installed and connected to the integrated EIDE adapter, and an AIX diagnostic CD-ROM is available.
 - OR
 - AIX standalone diagnostics can be booted from a NIM server.

3. If a power-on password or privileged-access password is set, you are prompted to enter the password before the AIX diagnostic CD-ROM can load.
4. The term POST indicators refers to the device mnemonics that appear during the power-on self-test (POST).
5. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer.

The following settings may be of interest.

Monitoring

(also called surveillance) From the ASMI menu, expand the System Configuration menu, then click on Monitoring. Disable both types of surveillance.

Auto power restart

(also called unattended start mode) From the ASMI menu, expand Power/Restart Control, then click on Auto Power Restart, and set it to disabled.

Wake on LAN®

From the ASMI menu, expand Wake on LAN, and set it to disabled. Call Out From the ASMI menu, expand the Service Aids menu, then click on Call-Home/Call-In Setup. Set the call-home system port and the call-in system port to disabled.

6. If this is a System p™, verify that the system has not been set to boot to the SMS menus or to the open firmware prompt. From the ASMI menu, expand Power/Restart Control to view the menu, then click on Power On/Off System. The AIX/Linux partition mode boot should say "Continue to Operating System".

Use this procedure to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

Perform the following procedure:

• **PFW1542-1**

1. Insure that the diagnostics and the operating system are shut down.
2. Turn off the power.
3. Select slow system boot speed on the power on/off system menu under the power/restart control menu on the ASMI.
4. Turn on the power.
5. Put the AIX diagnostic CD-ROM into the optical drive.

Does the optical drive appear to operate correctly?

NO Go to "Problems with loading and starting the operating system (AIX and Linux)" on page 268

YES Continue to PFW1542-2.

• **PFW1542-2**

1. When the keyboard indicator is displayed (the word keyboard), if the system or partition gets that far in the IPL process, press the 5 key on the firmware console.
2. Enter the appropriate password if you are prompted to do so.

Is the Please define the System Console screen displayed?

NO Continue to PFW1542-3.

YES Go to PFW1542-4.

• **PFW1542-3**

The system is unable to boot standalone AIX diagnostics. Check the service processor error log (using the ASMI) and the operator panel for additional error codes resulting from the slow boot that was performed in PFW1542-1.

Did the slow boot generate a different error code or partition firmware hang from the one that originally sent you to PFW1542?

NO If you were sent here by an error code, and the error code did not change as the result of a slow boot, you have a processor subsystem problem. Go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 336. If you were sent here because the system is hanging on a partition firmware checkpoint, and the hang condition did not change as a result of the slow boot, go to PFW1542-5.

YES Restore fast boot on the power on/off system menu from the ASMI. Look up the new error code in the reference code index and perform the listed actions.

- **PFW1542-4**

The system stopped with the please define the system console prompt on the system console. Standalone diagnostics can be booted. Perform the following:

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. If the terminal type has not been defined, you must use the Initialize Terminal option on the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate operation from selecting the firmware console.
4. Select Advanced Diagnostic Routines.
5. When the DIAGNOSTIC MODE SELECTION menu displays, select System Verification to run diagnostics on all resources.

Did running diagnostics produce a different symptom?

NO Go to the following step.

YES Return to the Problem Analysis procedures with the new symptom.

6. Record any devices missing from the list of all adapters and devices. Continue with this procedure. When you have fixed the problem, use this record to verify that all devices appear when you run system verification.

Are there any devices missing from the list of all adapters and devices?

NO Reinstall all remaining adapters, if any, and reconnect all devices. Return the system to its original configuration. Be sure to select fast boot on the power on/off system menu on the ASMI. Go to Chapter 5, “Verifying a repair,” on page 611.

YES The boot attempts that follow will attempt to isolate any remaining I/O subsystem problems with missing devices. Ignore any codes that may display on the operator panel unless stated otherwise. Continue to PFW1542-5.

- **PFW1542-5**

Examine RIO port 0 of the first RIO bus card (Un-P1-C8-T1) in the base system unit drawer.

Are there any I/O subsystems attached to this RIO card?

NO Go to PFW1542-25.

YES Continue to PFW1542-6.

- **PFW1542-6**

There may be devices missing from one of more of the I/O subsystems, or one or more devices in the I/O subsystems may be causing the system or a partition to hang during IPL.

Attention: The 5088 expansion unit, 5094 expansion unit, 5095 expansion unit, the 7311 Model D11 I/O subsystem, the 7311/D20 I/O subsystem or the 7314 Model G30 subsystem might be connected to this system.

The RIO and InfiniBand® ports on these subsystems are shown in the following table. Use this table to determine the physical location codes of the RIO or InfiniBand connectors that are mentioned in the remainder of this MAP.

	9117-MMA (base system drawer)	5088	5094	7311-D11	7311-D20	7314-G30	5095
RIO port 0 or InfiniBand port 0	Un-P1-C8-T2 (and U1-P1-C9-T2 if present)	Un-CB1- C10-00	Un-CB1- C08-00	Un-P1-C7-T1 (top connector)	Un-P1- C05-T2 (bottom connector)	Un-P1-C7-T1	Un-CB1- C05-00
RIO port 1 or InfiniBand port 1	Un-P1-C8-T1 (and U1-P1-C9-T1 if present)	Un-CB1- C10-01	Un-CB1- C08-01	Un-P1-C7-T2	Un-P1- C05-T1	Un-P1-C7-T2	Un-CB1- C05-01

Note: Before continuing, check the cabling from the base system to the I/O subsystem(s) to insure that the system is cabled correctly. Refer to the cabling information for your I/O enclosure for valid configurations. Record the current cabling configuration and then continue with the following steps.

In the following steps, the term *RIO cable* means either RIO cable or InfiniBand cable.

1. Turn off the power. Record the location and machine type and model number, or feature number, of each I/O drawer or tower. In the following steps, use this information to determine the physical location codes of the RIO connectors that are referred to by their logical names. For example, if I/O subsystem #1 is a 7311-D20 drawer, RIO port 0 is Un-P1-C05-T2.
2. At the base system drawer, disconnect the cable connection at RIO port 0 (Un-P1-C8-T2).
3. At the other end of the RIO cable referred to in step 2 of PFW1542-6, disconnect the I/O subsystem port connector 0. The RIO cable that was connected to RIO port 0 in the base system should now be loose; remove it. Record the location of this I/O subsystem and call it "subsystem #1".
4. Examine the connection at the I/O port connector 1 of the I/O subsystem recorded in step 3 of PFW1542-6. If the RIO cable attached to I/O port connector 1 connects to the I/O port connector 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #1, then go to step 9 of PFW1542-6.
5. This step is reserved.
6. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-C8-T1) and reconnect it to RIO port 0 (Un-P1-C8-T2).
7. At the I/O subsystem recorded in step 3 of PFW1542-6, disconnect the I/O port connector 1 and reconnect to I/O port 0.
8. Verify that a single RIO cable connects base system RIO port 0 (Un-P1-C8-T2) to the I/O subsystem recorded in step 4 port 0. Go to step 21 of PFW1542-6.
9. Record the location of the next I/O subsystem and call it "subsystem #2". This is the I/O subsystem that is connected to I/O port 1 of subsystem #1.
10. Examine the connection at the I/O port 1 of subsystem #2 recorded in step 9 of PFW1542-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #2 and call it "subsystem #3". Go to step 14 of PFW1542-6.
11. The RIO cable attached to the I/O port 1 of subsystem #2 is attached to port 1 (Un-P1-C8-T1) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-C8-T1) and reconnect it to RIO port 0 (Un-P1-C8-T2).

12. On subsystem #2, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
13. Verify that a single RIO cable connect base system RIO port 0 to one or two I/O subsystems. Go to step 21 of PFW1542-6.
14. Examine the connection at the I/O port 1 of subsystem #3 recorded in step 10 of PFW1542-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of the subsystem #3 and call it "subsystem #4". Go to step 18 of PFW1542-6.
15. The RIO cable attached to the I/O port 1 of subsystem #3 is attached to port 1 (Un-P1-C8-T1) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-C8-T1) and reconnect it to RIO port 0 (Un-P1-C8-T2).
16. On subsystem #3, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
17. Verify that a single RIO cable connects base system RIO port 0 to three I/O subsystems. Go to step 21 of PFW1542-6.
18. The RIO cable attached to the I/O port 1 of subsystem #4 is attached to port 1 (Un-P1-C8-T1) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-C8-T1) and reconnect it to RIO port 0 (Un-P1-C8-T2).
19. On subsystem #4, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
20. Verify that a single RIO cable connects base system RIO port 0 to four I/O subsystems. Continue to step 21 of PFW1542-6.
21. Turn on the power to boot the standalone AIX diagnostics from CD-ROM.
22. If the Please define the system console screen is displayed, follow the directions to select the system console.
23. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.
24. Verify that all adapters and the attached devices are listed.

Did the Please define the system console screen display and are all adapters and attached devices listed?

NO Go to PFW1542-7.

YES The RIO cable that was removed in step 3 above is defective. Replace this RIO cable.

If four I/O subsystems are chained to RIO port 0 (Un-P1-C8-T2) of the base system, connect the new RIO cable from subsystem #4 I/O port 1 to base system RIO port 1 (Un-P1-C8-T1).

If three I/O subsystems are chained to RIO port 0 (Un-P1-C8-T2) of the base system, connect the new RIO cable from subsystem #3 I/O port 1 to base system RIO port 1 (Un-P1-C8-T1).

If two I/O subsystems are chained to RIO port 0 (Un-P1-C8-T2) of the base system, connect the new RIO cable from subsystem #2 I/O port 1 to base system RIO port 1 (Un-P1-C8-T1).

If one I/O subsystem is chained to RIO port 0 (Un-P1-C8-T2) of the base system, connect the new RIO cable from subsystem #1 I/O port 1 to base system RIO port 1 (Un-P1-C8-T1).

Restore the system back to its original configuration. Go to Chapter 5, "Verifying a repair," on page 611.

- **PFW1542-7**

The I/O attached to the RIO ports on the base system planar will now be isolated. Power down the system. Disconnect the cable connection at RIO port 0 (Un-P1-C8-T2) of the base system.

- **PFW1542-8**

1. Turn on the power to boot the standalone diagnostic CD-ROM.
2. If the Please define the system console screen is displayed, follow the directions to select the system console.

3. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.

4. Check that all adapters and attached devices in the base system are listed.

If the Please define the system console screen was not displayed or all adapters and attached devices are not listed, the problem is in the base system.

Was the Please define the system console screen displayed and were all adapters and attached devices listed?

NO Go to PFW1542-25.

YES Go to PFW1542-21.

- **PFW1542-9**

For subsystem #1: **Are there any adapters in the I/O subsystem?**

NO Go to PFW1542-10.

YES Go to PFW1542-13.

- **PFW1542-10**

For subsystem #2: **Are there any adapters in the I/O subsystem?**

NO Go to PFW1542-11.

YES Go to PFW1542-14.

- **PFW1542-11**

For subsystem #3: **Are there any adapters in the I/O subsystem?**

NO Go to PFW1542-12.

YES Go to PFW1542-15.

- **PFW1542-12**

For subsystem #4: **Are there any adapters in the I/O subsystem?**

NO Go to PFW1542-19.

YES Go to PFW1542-16.

- **PFW1542-13**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from the I/O subsystem.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please select the system console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

Was the Please define the system console screen displayed and were all adapters and attached devices listed?

NO Go to PFW1542-10.

YES Go to PFW1542-17.

- **PFW1542-14**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.

3. Record the slot numbers of the adapters.
4. Remove all adapters from the I/O subsystem.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please select the system console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

Was the Please define the system console screen displayed and were all adapters and attached devices listed?

NO Go to PFW1542-11.

YES Go to PFW1542-17.

• **PFW1542-15**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from the I/O subsystem.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please select the system console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

Was the Please define the system console screen displayed and were all adapters and attached devices listed?

NO Go to PFW1542-12.

YES Go to PFW1542-17.

• **PFW1542-16**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from the I/O subsystem.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please define the system console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

Was the Please define the system console screen displayed and were all adapters and attached devices listed?

NO Go to PFW1542-19.

YES Go to PFW1542-17.

- **PFW1542-17**

If the Please define the system console screen was not displayed and all adapters and attached devices were not listed, the problem is with one of the adapter cards or attached devices that was removed or disconnected from the I/O subsystem.

1. Turn off the power.
2. Reinstall one adapter and device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn on the power to boot the standalone diagnostic CD-ROM.
4. If the Please define the system console screen is displayed, follow the directions to select the system console.
5. Use the Display Configuration and Resource List option to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

Was the Please define the system console screen displayed and were all adapters and attached devices listed?

NO Go to PFW1542-18.

YES Reinstall the next adapter and device and return to the beginning of this step. Repeat this process until an adapter or device causes the Please define the System Console screen to not display or all attached devices and adapters to not be listed.

After installing all of the adapters and the Please define the System Console screen does display and all attached devices and adapters are listed, return the system to its original configuration. Go to Chapter 5, "Verifying a repair," on page 611.

- **PFW1542-18**

Replace the adapter you just installed with a new adapter and retry booting AIX standalone diagnostics from CD-ROM.

1. If the Please define the system console screen is displayed, follow the directions to select the system console.
2. Use the Display Configuration and Resource List option to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

Was the Please define the system console screen displayed and were all adapters and attached devices listed?

NO The I/O subsystem backplane is defective. Replace the I/O subsystem backplane. In all 4 subsystem types, the I/O subsystem backplane is Un-CB1. Then go to PFW1542-20.

YES The adapter was defective. Go to PFW1542-20.

- **PFW1542-19**

1. Turn off the power.
2. Disconnect the I/O subsystem power cables.
3. Replace the following parts, one at a time, if present, in the sequence listed:
 - a. I/O subsystem #1 backplane
 - b. I/O subsystem #2 backplane
 - c. I/O subsystem #3 backplane
 - d. I/O subsystem #4 backplane
 - e. The RIO interface in the base system to which the RIO cables are presently attached.
4. Reconnect the I/O subsystem power cables.
5. Turn on the power.
6. Boot standalone AIX diagnostics from CD.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.

8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all attached devices and adapters are listed.

Did the Please define the System Console screen display and are all attached devices and adapters listed?

NO Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please define the System Console screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and the Please define the System Console screen does not display or all attached devices and adapters are not listed, check all external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

YES Go to PFW1542-20.

- **PFW1542-20**

1. Turn off the power.
2. The item just replaced fixed the problem.
3. If a display adapter with keyboard and mouse were installed, reinstall the display adapter card, keyboard, and mouse.
4. Reconnect the tape drive (if previously installed) to the internal SCSI bus cable.
5. Plug in all adapters that were previously removed but not reinstalled.
6. Reconnect the I/O subsystem power cables that were previously disconnected.

Return the system to its original condition. Go to Chapter 5, "Verifying a repair," on page 611.

- **PFW1542-21**

1. Turn off the power.
2. At the base system, reconnect the cable connection at RIO port 0 (Un-P1-C8-T2) recorded in PFW1542-7.
3. At the base system, reconnect the cable connection at RIO port 1(Un-P1-C8-T1) recorded in PFW1542-7.
4. Reconnect the power cables to the I/O subsystems that were found attached to the base system RIO ports mentioned in step 2 and step 3 of PFW1542-21. All I/O subsystems that were attached to the base system RIO port 0 and RIO port 1 should now be reconnected to the base system.
5. Make sure the I/O subsystem(s) are cabled correctly. See the cabling information for your I/O subsystem.
6. Turn on the power to boot standalone AIX diagnostics from CD-ROM.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

Did the Please define the System Console screen display and are all attached devices and adapters listed?

NO Go to PFW1542-9 to isolate a problem in an I/O subsystem attached to the base system RIO bus on the system backplane.

YES Go to PFW1542-22.

- **PFW1542-22**

Is there a RIO expansion card plugged into Un-P1-C9 in the base system, and if so, is there at least one I/O subsystem attached to it?

NO Go to PFW1542-25.

YES Continue to PFW1542-23.

- **PFW1542-23**

1. Turn off the power.
2. At the base system, reconnect the cable connection at RIO port 0 on the second RIO expansion card (Un-P1-C9-T2) recorded in PFW1542-7.
3. At the base system, reconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C9-T1) recorded in PFW1542-7.
4. Reconnect the power cables to the I/O subsystems that were attached to the base system's RIO ports mentioned in substeps 2 and 3 in this step. All I/O subsystems that were attached to RIO port 0 on the RIO expansion card (Un-P1-C9-T2) and RIO port 1 on the RIO expansion card (Un-P1-C9-T1) in the base system should now be reconnected to the system.
5. Make sure that the I/O subsystem(s) are cabled correctly as shown in the cabling information for your I/O expansion unit.
6. Turn on the power to boot the standalone AIX diagnostic CD-ROM.
7. If the Please define the system console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Verify that all adapters and attached devices are listed.

Did the Please define the system console screen display and are all adapters and attached devices listed?

NO Go to PFW1542-24 to isolate the problems in the I/O subsystems that are attached to the second RIO expansion card in the base system.

YES Go to PFW1542-25.

• PFW1542-24

At the base system, reconnect the second I/O subsystem to the RIO ports on the base system's expansion card at Un-P1-C9-T1 and Un-P1-C9-T2.

The RIO ports on these subsystems are shown in the following table. Use this table to determine the physical location codes of the RIO connectors that are mentioned in the remainder of this MAP.

	9117-MMA (base system drawer)	5088	5094	7311-D11	7311-D20	7314-G30	5095
RIO port 0 or InfiniBand port 0	Un-P1-C8-T2 (and U1-P1-C9-T2 if present)	Un-CB1- C10-00	Un-CB1- C08-00	Un-P1-C7-T1 (top connector)	Un-P1- C05-T2 (bottom connector)	Un-P1-C7-T1	Un-CB1- C05-00
RIO port 1 or InfiniBand port 1	Un-P1-C8-T1 (and U1-P1-C9-T1 if present)	Un-CB1- C10-01	Un-CB1- C08-01	Un-P1-C7-T2	Un-P1- C05-T1	Un-P1-C7-T2	Un-CB1- C05-01

Note: Before continuing, check the cabling from the base system to the I/O subsystem(s) to ensure that the system is cabled correctly. Record the current cabling configuration and then continue with the following steps.

1. Turn off the power.
2. Record the location and machine type and model number, or feature number, of each I/O drawer or tower. In the following steps, use this information to determine the physical location codes of the RIO connectors that are referred to by their logical names. For example, if I/O subsystem #1 is a 7311/D20 drawer, RIO port 0 is Un-P1-C05-00.
3. At the base system, disconnect the cable connection at RIO port 0 (Un-P1-C8-T2).

4. At the other end of the RIO cable referred to in step 2 of PFW1542-24, disconnect the I/O subsystem port connector 0. The RIO cable that was connected to RIO port 0 on the expansion card should now be loose; remove it. Record the location of this I/O subsystem and call it "subsystem #1".
5. Examine the connection at the I/O port connector 1 of the I/O subsystem recorded in step 3 of PFW1542-24. If the RIO cable attached to I/O port connector 1 connects to the I/O port connector 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #1, then go to step 9 of PFW1542-24.
6. This step is reserved.
7. At the base system, disconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C9-T1) and reconnect it to RIO port 0 on the RIO expansion card (Un-P1-C9-T2).
8. At the I/O subsystem recorded in step 3 of PFW1542-24, disconnect the I/O port connector 1 and reconnect to I/O port 0.
9. Verify that a single RIO cable connects base system RIO port 0 on the RIO expansion card (Un-P1-C9-T1) to the I/O subsystem recorded in step 4 of PFW1542-24 port 0. Go to step 21 of PFW1542-24.
10. Record the location of the next I/O subsystem and call it "subsystem #2". This is the I/O subsystem that is connected to I/O port 1 of subsystem #1.
11. Examine the connection at the I/O port 1 of subsystem #2 recorded in step 9 of PFW1542-24. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #2 and call it "subsystem #3". Go to step 14 of PFW1542-24.
12. The RIO cable attached to the I/O port 1 of subsystem #2 is attached to port 1 (Un-P1-C9-T1) of the base system. At the base system, disconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C9-T1) and reconnect it to RIO port 0 on the RIO expansion card (Un-P1-C9-T1).
13. On subsystem #2, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
14. Verify that a single RIO cable connect base system RIO port 0 to one or two I/O subsystems. Go to step 21 of PFW1542-24.
15. Examine the connection at the I/O port 1 of subsystem #3 recorded in step 10 of PFW1542-24. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of the subsystem #3 and call it "subsystem #4". Go to step 18 of PFW1542-24.
16. The RIO cable attached to the I/O port 1 of subsystem #3 is attached to RIO port 1 on the RIO expansion card (Un-P1-C9-T1). At the base system, disconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C9-T1) and reconnect it to RIO port 0 on the RIO expansion card (Un-P1-C9-T1).
17. On subsystem #3, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
18. Verify that a single RIO cable connects base system RIO port 0 to three I/O subsystems. Go to step 21 of PFW1542-24.
19. The RIO cable attached to the I/O port 1 of subsystem #4 is attached to port 1 (Un-P1-C9-T1) on the RIO expansion card. On the RIO expansion card, disconnect the cable connection at RIO port 1 (Un-P1-C9-T1) and reconnect it to RIO port 0 (Un-P1-C9-T2).
20. On subsystem #4, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
21. Verify that a single RIO cable connects base system RIO port 0 to four I/O subsystems. Continue to step 22 of PFW1542-24.
22. Turn on the power to boot the standalone AIX diagnostics from CD-ROM.

23. If the Please define the system console screen is displayed, follow the directions to select the system console.
24. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.
25. Verify that all adapters and the attached devices are listed.

Did the Please define the system console screen display and are all adapters and attached devices listed?

NO Go to PFW1542-9 to further isolate a problem in the I/O subsystem(s) attached to the RIO expansion card (Un-P1-C8).

YES The RIO cable that was removed in step 3 of PFW1542-24 is defective. Replace this RIO cable.

If four I/O subsystems are chained to RIO port 0 (Un-P1-C9-T1) of the base system, connect the new RIO cable from subsystem #4 I/O port 1 to RIO port 1 on the RIO expansion card (Un-P1-C9-T1).

If three I/O subsystems are chained to RIO port 0 (Un-P1-C9-T1) of the base system, connect the new RIO cable from subsystem #3 I/O port 1 to RIO port 1 on the RIO expansion card (Un-P1-C9-T1).

If two I/O subsystems are chained to RIO port 0 (Un-P1-C9-T1) of the base system, connect the new RIO cable from subsystem #2 I/O port 1 to RIO port 1 on the RIO expansion card (Un-P1-C9-T1).

If one I/O subsystem is chained to RIO port 0 (Un-P1-C9-T1) of the base system, connect the new RIO cable from subsystem #1 I/O port 1 to RIO port 1 on the RIO expansion card (Un-P1-C9-T1).

Restore the system back to its original configuration. Go to Chapter 5, "Verifying a repair," on page 611.

• **PFW1542-25**

Are there any adapters in slots 1, 2, 3, 4, 5, or 6 in the base system?

NO Go to PFW1542-26.

YES Go to PFW1542-28.

• **PFW1542-26**

Replace the system backplane, Un-P1. Continue to PFW1542-27.

• **PFW1542-27**

1. Boot standalone AIX diagnostics from CD.
2. If the Please define the System Console screen is displayed, follow directions to select the system console.
3. Use the Display Configuration and Resource List to list all adapters and attached devices.
4. Check that all adapters and attached devices are listed.

Did the Please define the System Console screen display and are all attached devices and adapters listed?

NO Go to PFW1542-31.

YES Go to PFW1542-20.

• **PFW1542-28**

1. If it is not already off, turn off the power.
2. Label and record the location of any cables attached to the adapters.
3. Record the slot number of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 5, and 6 in the base system that are not attached to the boot device.
5. Turn on the power to boot standalone AIX diagnostics from CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 key on the ASCII terminal's keyboard.

7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

Did the Please define the System Console screen display and are all attached devices and adapters listed?

NO Go to PFW1542-26.

YES Continue to PFW1542-29.

• **PFW1542-29**

If the Please define the System Console screen does display and all adapters and attached devices are listed, the problem is with one of the adapter cards or devices that was removed or disconnected from the base system.

1. Turn off the power.
2. Reinstall one adapter and device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn on the power to boot standalone AIX diagnostics from the optical drive.
4. If the Please define the System Console screen is displayed, follow the directions to select the system console.
5. Use the Display Configuration and Resource List to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

Did the Please define the System Console screen display and are all attached devices and adapters listed?

NO Continue to PFW1542-30.

YES Return to the beginning of this step to continue reinstalling adapters and devices.

• **PFW1542-30**

Replace the adapter you just installed with a new adapter and retry the boot to standalone AIX diagnostics from CD-ROM.

1. If the Please Define the System Console screen is displayed, follow directions to select the system console.
2. Use the Display Configuration and Resource List option to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

Did the Please define the System Console screen display and are all attached devices and adapters listed?

NO Go to PFW1542-26.

YES The adapter you just replaced was defective. Go to PFW1542-20.

• **PFW1542-31**

1. Turn off the power.
2. Disconnect the base system power cables.
3. Replace the following parts, one at a time, in the sequence listed:
 - a. Optical drive
 - b. Removable media backplane and cage assembly
 - c. Disk drive backplane and cage assembly
 - d. I/O backplane, location Un-P1
 - e. Service processor
4. Reconnect the base system power cables.
5. Turn on the power.

6. Boot standalone AIX diagnostics from CD.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

Did the Please define the System Console screen display and are all adapters and attached devices listed?

NO Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please define the System Console screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and the Please define the System Console screen does not display or all adapters and attached devices are not listed, check all external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

YES Go to PFW1542-20.

PFW1548: Memory and processor subsystem problem isolation procedure

Use this problem isolation procedure to aid in solving memory and processor problems that are not found by normal diagnostics.

Notes:

1. To avoid damage to the system or subsystem components, unplug the power cords before removing or installing any part.
2. This procedure assumes that either:
 - An optical drive is installed and connected to the integrated EIDE adapter, and an AIX diagnostic CD-ROM is available.
 - OR
 - AIX standalone diagnostics can be booted from a NIM server.
3. If a power-on password or privileged-access password is set, you are prompted to enter the password before the AIX diagnostic CD-ROM can load.
4. The term POST indicators refers to the device mnemonics that appear during the power-on self-test (POST).
5. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer. The following settings may be of interest.

Monitoring

(also called surveillance) From the ASMI menu, expand the System Configuration menu, then click on Monitoring. Disable both types of surveillance.

Auto power restart

(also called unattended start mode) From the ASMI menu, expand Power/Restart Control, then click on Auto Power Restart, and set it to disabled.

Wake on LAN

From the ASMI menu, expand Wake on LAN, and set it to disabled.

Call Out

From the ASMI menu, expand the Service Aids menu, then click on Call-Home/Call-In Setup. Set the call-home system port and the call-in system port to disabled.

6. If this is a System p, verify that the system has not been set to boot to the System Management Services (SMS) menus or to the open firmware prompt. From the ASMI menu, expand Power/Restart Control to view the menu, then click on Power On/Off System. The AIX/Linux partition mode boot should say "Continue to Operating System".
7. The service processor might have recorded one or more symptoms in its error/event log. Use the Advanced System Management Interface (ASMI) menus to view the error/event log.
 - If you arrived here after performing a slow boot, look for a possible new error that occurred during the slow boot. If there is a new error, and its actions call for a FRU replacement, perform those actions. If this does not resolve the problem, go to PFW1548-1.
 - If an additional slow boot has not been performed, or if the slow boot did not yield a new error code, look at the error that occurred just before the original error. Perform the actions associated with that error. If this does not resolve the problem, go to PFW1548-1.
 - If a slow boot results in the same error code, and there are no error codes before the original error code, go to PFW1548-1.

This procedure is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

Perform the following procedure:

• **PFW1548-1**

1. Insure that the diagnostics and the operating system are shut down.

Is the system at "service processor standby", indicated by "01" in the control panel?

NO Replace the service processor card, location: Un-P1-C11. Return to step PFW1548-1.

YES Continue with substep 2.

2. Turn on the power using either the white button or the HMC.

Does the managed system reach power on at hypervisor standby as indicated on the HMC?

NO Go to PFW1548-3.

YES Go to PFW1548-2.

3. Insert the AIX diagnostic CD-ROM into the optical drive.

Note: If you cannot insert the diagnostic CD-ROM, go to PFW1548-2.

4. When the keyboard indicator is displayed on an ASCII terminal, a directly-attached keyboard, or hardware management console (HMC), press the number 5 key.
5. If you are prompted to do so, enter the appropriate password.

Is the Please define the System Console screen displayed?

NO Go to PFW1548-2.

YES Go to PFW1548-14.

• **PFW1548-2**

Insert the AIX diagnostic CD-ROM into the optical drive.

Note: If you cannot insert the diagnostic CD-ROM, go to step PFW1548-3.

Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking on the "Advanced" button on the activation screen. On the "advanced" activation screen, select "boot in service mode using the default boot list" to boot the diagnostic CD-ROM.

If you are prompted to do so, enter the appropriate password.

Is the "Please define the System Console" screen displayed?

NO Go to PFW1548-3.

YES Go to PFW1548-20.

• **PFW1548-3**

1. Turn off the power.
2. If you have not already done so, configure the service processor (using the ASMI menus) with the instructions in note 6 at the beginning of this procedure, then return here and continue.
3. Exit the service processor (ASMI) menus and remove the power cords.
4. Disconnect all external cables (parallel, system port 1, system port 2, keyboard, mouse, USB devices, SPCN, Ethernet on the system planar, and so on). Also disconnect all of the external cables attached to the service processor except the Ethernet cable going to the HMC.

Is there more than one processor drawer in the system?

NO Go to PFW 1548-5.

YES Go to PFW1548-4.

• **PFW1548-4**

Disconnect the flex cables from the front and the back of all the processor drawers if not already disconnected.

Does the processor drawer with the service processor card power on OK?

NO Go to PFW 1548-5.

YES Go to PFW1548-17.

• **PFW1548-5**

1. Place the drawer into the service position and remove the service access cover.
2. Record the slot numbers of the PCI adapters and I/O expansion cards if present. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.
3. Remove the removable media enclosure assembly by pulling out the orange tabs and then sliding the media enclosure toward you approximately three centimeters.
4. Remove processor card #2 (if installed). If processor card #2 is removed, insure that processor card #1 is installed and contains at least one quad of DIMMs.
5. Record the slot numbers of the memory DIMMs on processor card #1. Remove all memory DIMMs except for one quad from processor card #1.

Notes:

- a. Place the memory DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.
 - b. Memory DIMMs must be installed in quads and in the correct connectors. Refer to Chapter 3, "Locating FRUs," on page 347 for information on memory DIMMs.
6. Remove the disk drives from the disk drive enclosure assembly.
 7. Release and disconnect the disk drive enclosure assembly by using the cam levers at the lower front part of the enclosure.
 8. Plug in the power cords and wait for "01" in the upper-left-hand corner of the control panel display.
 9. Turn on the power using either the HMC or the white button.

Does the managed system reach power on at hypervisor standby as indicated on the HMC?

NO Go to PFW1548-9.

YES Go to PFW1548-6.

• **PFW1548-6**

Were any memory DIMMs removed from processor card #1?

NO Go to PFW1548-11.

YES Go to PFW1548-7.

• **PFW1548-7**

1. Turn off the power, and remove the power cords.
2. Replug the memory DIMMs that were removed from processor card #1 in PFW1548-2 in their original locations.

Notes:

- a. Place the memory DIMM locking tabs into the locked (upright) position to prevent damage to the tabs.
- b. Memory DIMMs must be installed in quads in the correct connectors. Refer to Chapter 3, "Locating FRUs," on page 347 for information on memory DIMMs.
3. Plug in the power cords and wait for "01" in the upper-left corner of the control panel display.
4. Turn on the power using either the HMC or the white button.

Does the managed system reach power on at hypervisor standby as indicated on the HMC?

NO A memory DIMM in the quad you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMMs in that quad one at a time with new or previously removed memory DIMMs. Repeat this step until the defective memory DIMM is identified, or all memory DIMMs have been exchanged.

If your symptom did not change and all the memory DIMMs have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

YES Go to PFW1548-8.

• **PFW1548-8**

Was processor card #2 removed from the system?

NO Go to PFW1548-10.

YES Go to PFW1548-9.

• **PFW1548-9**

One of the FRUs remaining in the system unit is defective.

Note: If a memory DIMM is exchanged, insure that the new memory DIMM is the same size and speed as the original memory DIMM.

1. Turn off the power, remove the power cords, and exchange the following FRUs in the order listed:
 - a. Memory DIMMs. Exchange one at a time with new or previously removed DIMMs
 - b. Processor card #1, location: Un-P2-C1.
 - c. Processor backplane, location: Un-P2
 - d. Power supplies, locations: Un-E1 and Un-E2.
 - e. Processor regulators, locations: Un-P2-C3, Un-P2-C4, Un-P2-C5.
 - f. Service processor, location: Un-P1-C11.
 - g. I/O backplane, location: Un-P1.
2. Plug in the power cords and wait for "01" in the upper-left corner of the control panel display.
3. Turn on the power using either the HMC or the white button.

Does the managed system reach power on at hypervisor standby as indicated on the HMC?

NO Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

YES Go to Chapter 5, "Verifying a repair," on page 611.

• **PFW1548-10**

No failure was detected with this configuration.

1. Turn off the power and remove the power cords.
2. Reinstall processor card #2.
3. Plug in the power cords and wait for "01" in the upper-left corner of the control panel display.
4. Turn on the power using either the HMC or the white button.

Does the managed system reach power on at hypervisor standby as indicated on the HMC?

NO One of the FRUs remaining in the system is defective.

Exchange the FRUs (that have not already been changed) in the following order:

1. Memory DIMMs (if present) on processor card #2. Exchange the DIMMs one at a time with new or previously removed DIMMs.
2. Processor card #2
3. Processor backplane, location: Un-P2.
4. Power supplies, locations: Un-E1 and Un-E2.
5. Processor regulators, locations: Un-P2-C3, Un-P2-C4, Un-P2-C5.
6. Service processor, location: Un-P1-C11.
7. I/O backplane, location: Un-P1.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

YES Go to PFW1548-11.

• **PFW1548-11**

1. Turn off the power.
2. Reconnect the system console.

Notes:

- a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.
 - b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard and mouse into the keyboard connector on the rear of the system unit.
3. Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX

partition by clicking on the "Advanced" button on the activation screen. On the "advanced" activation screen, select "boot in service mode using the default boot list" to boot the diagnostic CD-ROM.

4. If the ASCII terminal or graphics display (including display adapter) is connected differently from the way it was previously, the console selection screen appears. Select a firmware console.
5. When the word keyboard is displayed, press the number 1 key on the directly attached keyboard, an ASCII terminal or HMC. This activates the system management services (SMS).
6. Enter the appropriate password if you are prompted to do so.

Is the SMS screen displayed?

NO One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. If you are using an ASCII terminal, go to the problem determination procedures for the display. If you do not find a problem, do the following:
 - a. Replace the service processor, location: Un-P1-C11.
 - b. Replace the I/O backplane, location: Un-P1.
2. If you are using a graphics display, go to the problem determination procedures for the display. If you do not find a problem, do the following:
 - a. Replace the display adapter.
 - b. Replace the backplane in which the graphics adapter is plugged.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

YES Go to the next step.

• **PFW1548-12**

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Use the cam levers to reconnect the disk drive enclosure assembly to the I/O backplane.
4. Reconnect the removable media enclosure assembly by sliding the media enclosure toward the disk drive backplane and then pressing the orange tabs.
5. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
6. Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking on the "Advanced" button on the activation screen. On the "advanced" activation screen, select "boot in service mode using the default boot list" to boot the diagnostic CD-ROM.
7. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

Is the Please define the System Console screen displayed?

NO One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. Optical drive
2. Removable media enclosure.

3. Disk drive enclosure (no disk drives at this time)
4. I/O backplane, Un-P1.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

YES Go to the next step.

• **PFW1548-13**

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Install a disk drive in the disk drive enclosure assembly.
4. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
5. Turn on the power.
6. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the Please define the System Console screen displayed?

NO Exchange the FRUs that have not been exchanged, in the following order:

1. Last disk drive installed
2. Disk drive enclosure assembly.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

YES Repeat this step with all disk drives that were installed in the disk drive backplane.

After all of the disk drives have been reinstalled, go to the next step.

• **PFW1548-14**

The system is working correctly with this configuration. One of the devices that was disconnected from the system backplane may be defective.

1. Turn off the power and remove the power cords.
2. Attach a system backplane device (for example: system port 1, system port 2, USB, keyboard, mouse, Ethernet) that had been removed.

After all of the I/O backplane device cables have been reattached, reattached the cables to the service processor one at a time.

3. Plug in the power cords and wait for "01" in the upper-left corner on the operator panel display.
4. Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking on the "Advanced" button on the activation screen. On the "advanced" activation screen, select "boot in service mode using the default boot list" to boot the diagnostic CD-ROM.

5. If the Console Selection screen is displayed, choose the system console.
6. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the Please define the System Console screen displayed?

NO The last device or cable that you attached is defective.

To test each FRU, exchange the FRUs in the following order:

1. Device and cable (last one attached)
2. If the last cable in this step was reconnected to the service processor, replace the service processor.
3. I/O backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

YES Repeat this step until all of the devices are attached. Go to the next step.

• **PFW1548-15**

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed may be defective.

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
4. Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking on the "Advanced" button on the activation screen. On the "advanced" activation screen, select "boot in service mode using the default boot list" to boot the diagnostic CD-ROM.
5. If the Console Selection screen is displayed, choose the system console.
6. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the Please define the System Console screen displayed?

NO Go to the next step.

YES Repeat this step until all of the FRUs (adapters) are installed. Go to Chapter 5, "Verifying a repair," on page 611.

• **PFW1548-16**

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for the "01" in the upper-left corner on the operator panel display.
5. Turn on the power using either the HMC or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking on the "Advanced" button on the activation screen. On the "advanced" activation screen, select "boot in service mode using the default boot list" to boot the diagnostic CD-ROM.

6. If the Console Selection screen is displayed, choose the system console.
7. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

Is the Please define the System Console screen displayed?

NO Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. I/O backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

YES The last device or cable that you disconnected is defective. Exchange the defective device or cable then go to the next step.

• **PFW1548-17**

Reattach the flex cables, if present, both front and back. Return the system to its original configuration. Reinstall the control panel, the VPC card, and the service processor in the original primary processor drawer. Reattach the power cords and power on the system.

Does the system come up properly?

NO Go to the next step.

YES Go to Chapter 5, "Verifying a repair," on page 611.

• **PFW1548-18**

Have all of the drawers been tested individually with the physical control panel (if present), service processor, and VPD card?

NO

1. Detach the flex cables from the front and back of the system if not already disconnected.
2. Remove the service processor card, the VPD card, and the control panel from the processor drawer that was just tested.
3. Install these parts in the next drawer in the rack, going top to bottom.
4. Go to step PFW1548-3.

YES Reinstall the control panel, the VPD card, and the service processor card in the original primary processor drawer. Return the system to its original configuration.

Suspect a problem with the flex cables. If the error code indicates a problem with the SPCN or service processor communication between drawers, replace the flex cable in the rear. If the error code indicates a problem with inter-processor drawer communication, replace the flex cable on the front of the system.

Did replacing the flex cable(s) resolve the problem?

NO Go to step the next step.

YES The problem is resolved. Go to Chapter 5, "Verifying a repair," on page 611.

• **PFW1548-19**

Replacing the flex cables did not resolve the problem. If the problem appears to be with the service processor or SPCN signals, suspect the I/O backplanes. If the problem appears to be with processor communication, suspect the processor cards.

Replace the I/O backplanes, or processor cards, one at a time until the defective part is found.

Did this resolve the problem?

NO Contact your next level of support.

YES The problem is resolved. Go to Chapter 5, "Verifying a repair," on page 611.

- **PFW1548-20**

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. Select Advanced Diagnostics Routines.
4. If the terminal type has not been defined, you must use the initialize terminal option on the FUNCTION SELECTION menu to initialize the AIX diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the NEW RESOURCE screen is displayed, select an option from the bottom of the screen.

Note: Adapters and devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select All Resources. (If you were sent here from step PFW1548-21, select the adapter or device that was loaded from the supplemental media).

Did you get an SRN?

NO Go to step PFW1548-22.

YES Go to then next step.

- **PFW1548-21**

Look at the FRU part numbers associated with the SRN.

Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?

NO Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged. Go to Chapter 5, "Verifying a repair," on page 611.

YES If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-22**

Does the system have adapters or devices that require supplemental media?

NO Go to step the next step.

YES Go to step PFW1548-24.

- **PFW1548-23**

Consult the PCI adapter configuration documentation for your operating system to verify that all adapters are configured correctly.

Go to Chapter 5, "Verifying a repair," on page 611.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-24**

1. Select Task Selection.

2. Select Process Supplemental Media and follow the on-screen instructions to process the media. Supplemental media must be loaded and processed one at a time.

Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?

NO Go to the next step.

YES Press F3 to return to the FUNCTION SELECTION screen. Go to step PFW1548-24, substep 4 on page 345.

- **PFW1548-25**

The adapter or device is probably defective.

If the supplemental media is for an adapter, replace the FRUs in the following order:

1. Adapter
2. I/O backplane, location: Un-P1.

If the supplemental media is for a device, replace the FRUs in the following order:

1. Device and any associated cables
2. The adapter to which the device is attached

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, perform problem analysis and follow the instructions for the new symptom.

Go to Chapter 5, "Verifying a repair," on page 611.

End of procedure.

Chapter 3. Locating FRUs

You can identify the enclosure in which a FRU is plugged by its location code. The first character of the location code is always U followed by a four character feature code or enclosure type as shown in the following example: U7879.001.10ABCDE-P3-C31 In this example the enclosure type is **7879**.

The next three characters of the location code indicate the model of the enclosure (**001** in the example). The next string of characters provides the enclosure serial number (**10ABCDE** in the example).

Using this information, locate the enclosure with the FRU you want to replace. Find the enclosure type in the following table and go to the service guide for that enclosure:

Feature Code (Utttt)	Model	Enclosure Service Guide
789D	9406-MMA	Go to “Physical Locations” on page 348.
5790	5790	Refer to the <i>Service Guide for the 7311 Model D11</i> , SA76-0115.
5796	5796	Refer to the <i>Service Guide for the 7314 Model G30</i> , SA76-0083.
0595	0595	Refer to the <i>Service Guide for the 7311 Model D20</i> , SA76-0116.
5095	5095	
5786	5786	Refer to the <i>Service Guide for the 7031 Models D24 and T24</i> , SA76-0118.
5787	5787	
5094	5094	Refer to the <i>Service Guide for I/O enclosures 5094, 5294, 5096, and 5296</i> , SA76-0117.
5294	5294	
5096	5096	
5296	5296	

Feature Code (Utttt)	Model	Enclosure Service Guide
789D	9117-MMA	Go to “Physical Locations” on page 348.
5790	7311-D10	Refer to the <i>Service Guide for the 7311 Model D11</i> , SA76-0115.
1300	7311-D11	Refer to the <i>Service Guide for the 7311 Model D11</i> , SA76-0115.
5796	7314-G30	Refer to the <i>Service Guide for the 7314 Model G30</i> , SA76-0083.
0595	7311-D20	Refer to the <i>Service Guide for the 7311 Model D20</i> , SA76-0116.
5786	7031-T24	Refer to the <i>Service Guide for the 7031 Models D24 and T24</i> , SA76-0118.
5787	7031-D24	

Locate the FRU

The string of characters following the enclosure serial number identifies the FRU location within the enclosure: U7879.001.10ABCDE-P3-C31 In this example, **P3-C31** is the location of the FRU to be replaced. Use the graphics and tables to locate the FRU and link to its removal and replacement procedure.

“Physical Locations” on page 348

Use the following illustrations to help you map a location code to a position on the server.

“Addresses” on page 354

You can find part locations using location codes.

Physical Locations

Use the following illustrations to help you map a location code to a position on the server.

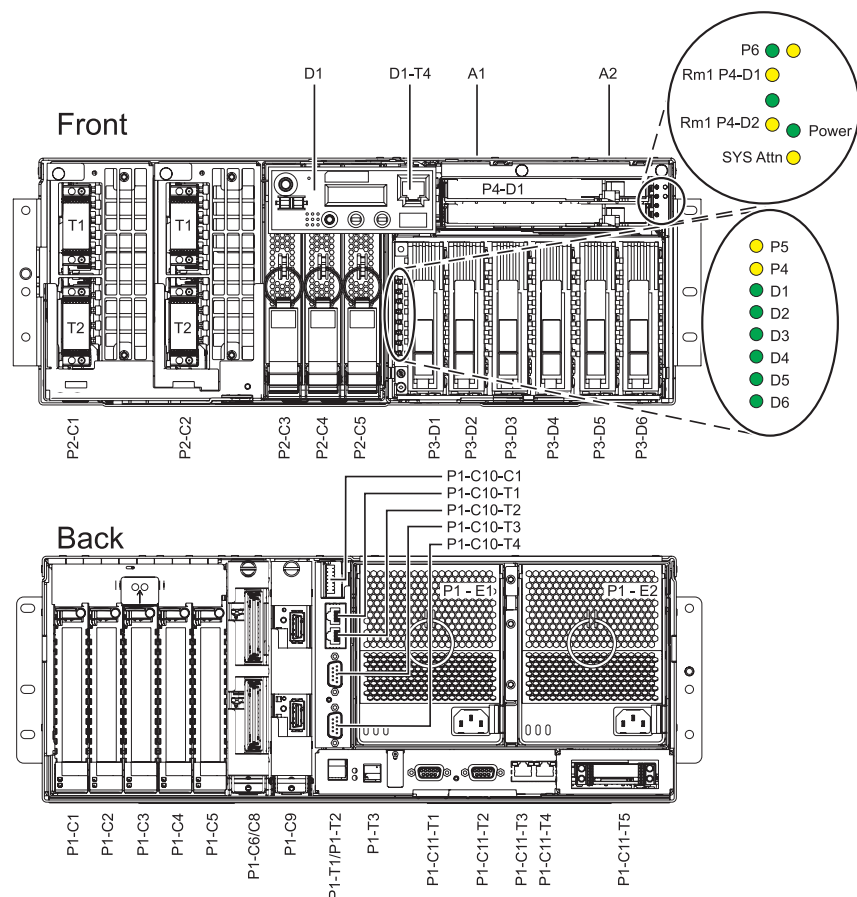


Figure 4. Front and rear views of the system unit

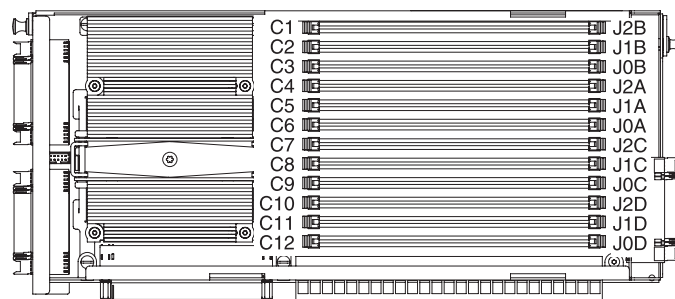


Figure 5. Memory module locations on the processor card (Un-P2-Cx)

Use the following illustration to map a node location when you are working with a multiple node installation. All of the nodes have the same location codes inside the system unit; only the serial number is different (Utttt.mmm.ssssss-).

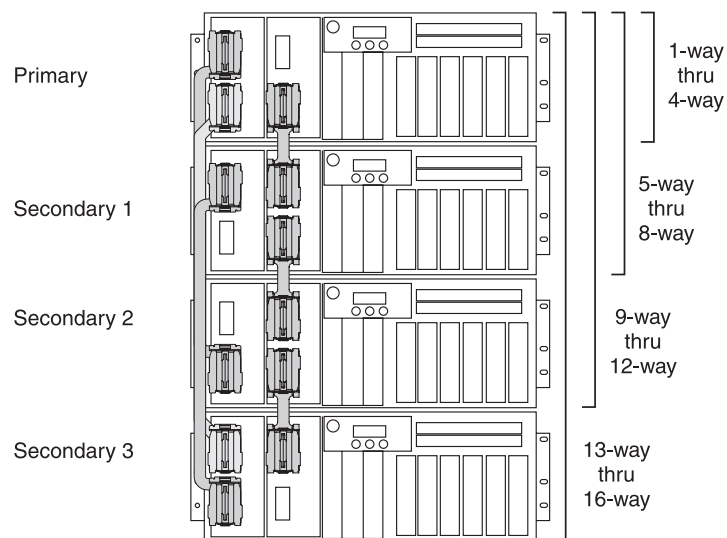


Figure 6. Multiple node locations with SMP processor cable shown

Table 40. FRU Location Table.

Failing item name	Physical location code	Identify LED	Failing item removal and replacement procedures
System unit	Un		
Fans			
Fan 1	Un-A1	Yes	"Fans" on page 422
Fan 2	Un-A2	Yes	"Fans" on page 422
Power supplies			
Power supply 1	Un-E1	Yes	"Power supply" on page 522
Power supply 2	Un-E2	Yes	"Power supply" on page 522
Backplanes			
Input/output backplane with embedded: <ul style="list-style-type: none"> • RIO Hub/HSL NIC • RIO/HSL link • Ethernet controller • USB controller (AIX or Linux only) • SAS controllers • Logic oscillator 	Un-P1	Yes	"I/O Backplane" on page 430
Regulator distribution connection backplane	Un-P2	Yes	"System backplane" on page 565
Disk drive backplane	Un-P3	Yes	"Disk unit enclosure" on page 414

Table 40. FRU Location Table (continued).

Failing item name	Physical location code	Identify LED	Failing item removal and replacement procedures
Media drive backplane	Un-P4	Yes	"Media device enclosure" on page 451
Ports			
system port 2 (back of system unit)	Un-P1-C10-T3		"External Cables" on page 360
system port 1 (back of system unit)	Un-P1-C10-T4		"External Cables" on page 360
Integrated 2-port USB port 1 (AIX or Linux only)	Un-P1-T1		"External Cables" on page 360
Integrated 2-port USB port 2 (AIX or Linux only)	Un-P1-T2		"External Cables" on page 360
Integrated dual 1 GB Ethernet controller-port 1	Un-P1-C10-T2		"External Cables" on page 360
Integrated dual 1 GB Ethernet controller-port 2	Un-P1-C10-T1		"External Cables" on page 360
System cable connector	Un-P1-C11-T5		
Processor and processor regulator			
Processor card 1	Un-P2-C1	Yes	"System processor assembly" on page 572
Processor card 2	Un-P2-C2	Yes	"System processor assembly" on page 572
SMP processor cable	Un-P2-C1-T1 Un-P2-C1-T2 Un-P2-C2-T1 Un-P2-C2-T2		"SMP cable" on page 562
Temperature sensor	Un -P2-C1 Un -P2-C2		
Voltage regulator 1	Un-P2-C3	Yes	"Voltage regulator assembly" on page 582
Voltage regulator 2	Un-P2-C4	Yes	"Voltage regulator assembly" on page 582
Voltage regulator 3	Un-P2-C5	Yes	"Voltage regulator assembly" on page 582
VPD Passthru card	Un-P1-C10 Feature 5639: serial port 1 at bottom is T4 and serial port 2 top is T3, Ethernet port 1 is T2 and port 2 is T1 Feature 5637: serial port 2 is T3, Ethernet port 1 is T2 and port 2 is T1 Feature 5639: port 2 is T5, Ethernet Port 1 is T4 (top), port 2 is T3, port 3 is T2 and port 4 is T1		"VPD passthru card" on page 593
VPD card	Un-P1-C10-C1		"VPD Card" on page 589
Service processor			

Table 40. FRU Location Table (continued).

Failing item name	Physical location code	Identify LED	Failing item removal and replacement procedures
Service processor card	Un-P1-C11	Yes	“Service processor assembly and time-of-day battery” on page 531
Service processor cable	Un-P1-C11-T5		“Service processor cable” on page 560
Time-of-day (TOD)	Un-P1-C11		“Service processor assembly and time-of-day battery” on page 531
Time-of-day Battery	Un-P1-C11-E1		“Service processor assembly and time-of-day battery” on page 531
HMC 1 connector	Un-P1-C11-T3		“External Cables” on page 360
HMC 2 connector	Un-P1-C11-T4		“External Cables” on page 360
SPCN 0 connector	Un-P1-C11-T1		“External Cables” on page 360
SPCN 1 connector	Un-P1-C11-T2		“External Cables” on page 360
Adapters			
PCI adapter in slot 1	Un-P1-C1	Yes	“PCI adapter” on page 470
PCI adapter in slot 2	Un-P1-C2	Yes	“PCI adapter” on page 470
PCI adapter in slot 3	Un-P1-C3	Yes	“PCI adapter” on page 470
PCI adapter in slot 4	Un-P1-C4	Yes	“PCI adapter” on page 470
PCI adapter in slot 5	Un-P1-C5	Yes	“PCI adapter” on page 470
PCI adapter in slot 6	Un-P1-C6	Yes	“C6 PCI adapter” on page 519
RIO/HSL adapter or 12x host channel adapter	Un-P1-C8	Yes	“RIO/HSL adapter / 12X host channel adapter” on page 466
RIO/HSL adapter or 12x host channel adapter	Un-P1-C9	Yes	“RIO/HSL adapter / 12X host channel adapter” on page 466
RIO/HSL adapter/ 12x host channel adapter connector	Un-P1-C8-T1	Yes	“External Cables” on page 360
RIO/HSL adapter/ 12x host channel adapter connector	Un-P1-C8-T2	Yes	“External Cables” on page 360
RIO/HSL adapter/ 12x host channel adapter connector	Un-P1-C9-T1	Yes	“External Cables” on page 360
RIO/HSL adapter/ 12x host channel adapter connector	Un-P1-C9-T2	Yes	“External Cables” on page 360
Memory modules			
Memory module 1	Un-P2-C1-C1	Yes	“Memory DIMM” on page 456
Memory module 2	Un-P2-C1-C2	Yes	“Memory DIMM” on page 456
Memory module 3	Un-P2-C1-C3	Yes	“Memory DIMM” on page 456
Memory module 4	Un-P2-C1-C4	Yes	“Memory DIMM” on page 456
Memory module 5	Un-P2-C1-C5	Yes	“Memory DIMM” on page 456
Memory module 6	Un-P2-C1-C6	Yes	“Memory DIMM” on page 456
Memory module 7	Un-P2-C1-C7	Yes	“Memory DIMM” on page 456
Memory module 8	Un-P2-C1-C8	Yes	“Memory DIMM” on page 456
Memory module 9	Un-P2-C1-C9	Yes	“Memory DIMM” on page 456
Memory module 10	Un-P2-C1-C10	Yes	“Memory DIMM” on page 456

Table 40. FRU Location Table (continued).

Failing item name	Physical location code	Identify LED	Failing item removal and replacement procedures
Memory module 11	Un-P2-C1-C11	Yes	"Memory DIMM" on page 456
Memory module 12	Un-P2-C1-C12	Yes	"Memory DIMM" on page 456
Memory module 1	Un-P2-C2-C1	Yes	"Memory DIMM" on page 456
Memory module 2	Un-P2-C2-C2	Yes	"Memory DIMM" on page 456
Memory module 3	Un-P2-C2-C3	Yes	"Memory DIMM" on page 456
Memory module 4	Un-P2-C2-C4	Yes	"Memory DIMM" on page 456
Memory module 5	Un-P2-C2-C5	Yes	"Memory DIMM" on page 456
Memory module 6	Un-P2-C2-C6	Yes	"Memory DIMM" on page 456
Memory module 7	Un-P2-C2-C7	Yes	"Memory DIMM" on page 456
Memory module 8	Un-P2-C2-C8	Yes	"Memory DIMM" on page 456
Memory module 9	Un-P2-C2-C9	Yes	"Memory DIMM" on page 456
Memory module 10	Un-P2-C2-C10	Yes	"Memory DIMM" on page 456
Memory module 11	Un-P2-C2-C11	Yes	"Memory DIMM" on page 456
Memory module 12	Un-P2-C2-C12	Yes	"Memory DIMM" on page 456
Note: First quad of memory modules is plugged into memory module slots P2-Cx-C3, P2-Cx-C6, P2-Cx-C9, and P2-Cx-C12. Second quad of memory modules is plugged into memory module slots P2-Cx-C2, P2-Cx-C5, P2-Cx-C8, and P2-Cx-C11. Third quad of memory modules is plugged into memory module slots P2-Cx-C1, P2-Cx-C4, P2-Cx-C7, and P2-Cx-C10.			
Device physical locations			
Disk drive 1	Un-P3-D1 (logical location with RAID card Un-P1-T13-L5-L0, logical location without RAID card Un-P1-T14-L5-L0)	Yes	"Disk Drive" on page 366
Disk drive 2	Un-P3-D2 (logical location with RAID card Un-P1-T13-L4-L0, logical location without RAID card Un-P1-T14-L4-L0)	Yes	"Disk Drive" on page 366
Disk drive 3	Un-P3-D3 (logical location with RAID card Un-P1-T13-L3-L0, logical location without RAID card Un-P1-T14-L3-L0)	Yes	"Disk Drive" on page 366

Table 40. FRU Location Table (continued).

Failing item name	Physical location code	Identify LED	Failing item removal and replacement procedures
Disk drive 4	Un-P3-D4 (logical location with RAID card) Un-P1-T12-L5-L0, logical location without RAID card Un-P1-T12-L5-L0)	Yes	"Disk Drive" on page 366
Disk drive 5	Un-P3-D5 (logical location with RAID card) Un-P1-T12-L4-L0, logical location without RAID card Un-P1-T12-L4-L0)	Yes	"Disk Drive" on page 366
Disk drive 6	Un-P3-D6 (logical location with RAID card) Un-P1-T12-L3-L0, logical location without RAID card Un-P1-T12-L3-L0)	Yes	"Disk Drive" on page 366
IDE drive 1	Un-P4-D1	Yes	"Removable media" on page 528
Control panel			
Control panel (bottom media bay)	Un -D1		"Control panel" on page 361
Control panel system port 1	Un -D1-T4		"External Cables" on page 360
Server firmware			
Server firmware	Un-Y1		

Addresses

You can find part locations using location codes.

Use the address to find the location for the 9117-MMA, then go to “Physical Locations” on page 348 to find additional information.

Table 41. IOA, and device address information for 9117-MMA running i5/OS

Position	Possible failing item	DSA (BBBBCcbb)	Unit address
Un -P1	Embedded SAS controller	0200-20-00 (primary) 0220-20-00 (secondary 1) 0240-20-00 (secondary 2) 0260-20-00 (secondary 3)	Not applicable
Un -P1-C1	PCI adapter	0204-00-00 (primary) 0224-00-00 (secondary 1) 0244-00-00 (secondary 2) 0264-00-00 (secondary 3)	Not applicable
Un -P1-C2	PCI adapter	0205-00-00 (primary) 0225-00-00 (secondary 1) 0245-00-00 (secondary 2) 0265-00-00 (secondary 3)	Not applicable
Un -P1-C3	PCI adapter	0206-00-00 (primary) 0226-00-00 (secondary 1) 0246-00-00 (secondary 2) 0266-00-00 (secondary 3)	Not applicable
Un -P1-C4	PCI adapter	0201-10-00 (primary) 0221-10-00 (secondary 1) 0241-10-00 (secondary 2) 0261-10-00 (secondary 3)	Not applicable
Un -P1-C5	PCI adapter	0202-10-00 (primary) 0222-10-00 (secondary 1) 0242-10-00 (secondary 2) 0262-10-00 (secondary 3)	Not applicable
Un -P1-C6	PCI adapter	0207-00-00 (primary) 0227-00-00 (secondary 1) 0247-00-00 (secondary 2) 0267-00-00 (secondary 3)	Not applicable

Table 41. IOA, and device address information for 9117-MMA running i5/OS (continued)

Position	Possible failing item	DSA (BBBBCcbb)	Unit address
Un -P3-D1	Disk drive 1	0200-20-00 (primary) 0220-20-00 (secondary 1) 0240-20-00 (secondary 2) 0260-20-00 (secondary 3)	000200FF
Un -P3-D2	Disk drive 2	0200-20-00 (primary) 0220-20-00 (secondary 1) 0240-20-00 (secondary 2) 0260-20-00 (secondary 3)	000300FF
Un -P3-D3	Disk drive 3	0200-20-00 (primary) 0220-20-00 (secondary 1) 0240-20-00 (secondary 2) 0260-20-00 (secondary 3)	000400FF
Un -P3-D4	Disk drive 4	0200-20-00 (primary) 0220-20-00 (secondary 1) 0240-20-00 (secondary 2) 0260-20-00 (secondary 3)	000500FF
Un -P3-D5	Disk drive 5	0200-20-00 (primary) 0220-20-00 (secondary 1) 0240-20-00 (secondary 2) 0260-20-00 (secondary 3)	000600FF
Un -P3-D6	Disk drive 6	0200-20-00 (primary) 0220-20-00 (secondary 1) 0240-20-00 (secondary 2) 0260-20-00 (secondary 3)	000700FF
Un -P4-D1	IDE drive 1	0200-20-00 (primary) 0220-20-00 (secondary 1) 0240-20-00 (secondary 2) 0260-20-00 (secondary 3)	040000FF

Chapter 4. Removing and Replacing FRUs

Use these procedures to remove and replace failing parts.

Before you begin a replacement, perform these tasks:

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

DANGER

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

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

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

To Disconnect:

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

To Connect:

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

(D005)

Attention:

Failure to follow the step-by-step sequence for FRU removal or installation may result in FRU or system damage.

Use the following precautions whenever you handle electronic components or cables.

- The electrostatic discharge (ESD) kit and the ESD wrist strap must be used when handling logic cards, SCMs, MCMs, electronic boards, and disk drives.
- Keep all electronic components in the shipping container or envelope until you are ready to install them.
- If you remove, then reinstall an electronic component, temporarily place the component on an ESD pad or blanket.

“External Cables” on page 360

Use this information to replace an external cable except the service processor cable or SMP cable. If viewing this document in an electronic copy of the PDF, you can locate the removal and replacement procedure for a service processor cable or SMP cable by using the bookmark tab on the left. If viewing a printed hardcopy of this document, use the Contents section at the beginning of this document to locate those procedures.

“Control panel” on page 361
Use this procedure to replace the control panel.

“Disk Drive” on page 366
Use this procedure to replace the disk drive.

“Disk unit enclosure” on page 414
Use this procedure to service a disk unit enclosure.

“Fans” on page 422
Use this procedure to replace a fan.

“I/O Backplane” on page 430
Use this procedure to service the I/O backplane.

“Media device enclosure” on page 451
Use this procedure to service the media device enclosure.

“Memory DIMM” on page 456
Use this procedure to service the memory DIMM.

“RIO/HSL adapter / 12X host channel adapter” on page 466
Use this procedure to service the HSL/RIO adapter or 12X host channel adapter.

“PCI adapter” on page 470
Use this procedure to service a PCI adapter.

“C6 PCI adapter” on page 519
Use this procedure to service a PCI adapter in location P1-C6.

“Power supply” on page 522
Use this procedure to service the power supply.

“Removable media” on page 528
Use this procedure to replace the removable media device.

“Service processor assembly and time-of-day battery” on page 531
Use this procedure to service the service processor assembly and time-of-day battery.

“Service processor cable” on page 560
Use this information to replace the service processor cable.

“SMP cable” on page 562
Use this information to replace the SMP cable.

“System backplane” on page 565
Use this procedure to service a system backplane.

“System processor assembly” on page 572
Use this procedure to service a system processor assembly.

“Voltage regulator assembly” on page 582
Use this procedure to service the voltage regulator assembly.

“VPD Card” on page 589
Use this procedure to service the vital product data (VPD) card.

“VPD passthru card” on page 593
Use this procedure to service the VPD passthru card.

External Cables

Use this information to replace an external cable except the service processor cable or SMP cable. If viewing this document in an electronic copy of the PDF, you can locate the removal and replacement procedure for a service processor cable or SMP cable by using the bookmark tab on the left. If viewing a printed hardcopy of this document, use the Contents section at the beginning of this document to locate those procedures.

1. Open the back rack door

Open the back rack door.

2. Remove the External Cables

Use the locations information to locate the cable.

Trace the cable and record the system location at the other end before removing the cable.

3. Install the External Cables

Use the locations information to locate the location where the cable is to be installed.

Install the cable, then route and install the other end of the cable to the system location that was previously recorded.

4. Close the back rack door

Close the back rack door.

5. Verify the repair

Go to Chapter 5, "Verifying a repair," on page 611.

Control panel

Use this procedure to replace the control panel.

1. Begin the repair

Control panel replacement can be performed with the system powered on and concurrently with system operations. To do this you will need to access the Advanced System Management Interface (ASMI). Choose one of the following options:

- For concurrent repair, continue with the next step.
 - For non-concurrent repair (system powered off), go to step 5 on page 362.
-

2. Access the ASMI

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power. The ASMI may also be referred to as the service processor menus.

To access the ASMI, refer to “Accessing the ASMI” on page 702.

When you have accessed the ASMI, continue with the next step.

3. Prepare the Control Panel for concurrent replacement

1. In the navigation area of the ASMI, expand “**Concurrent Maintenance**” then select “**Control panel**”.
2. At the Preparing the control panel window, select “Remove” and click “Continue”.
3. Choose the control panel’s location and click “Save Settings”.
4. If the operation was successful, the window will display, “Operation completed successfully”.

Did the operation complete successfully?

Yes	No
You will be doing a concurrent repair.	You will be doing a non-concurrent repair.
Continue with the next step.	Go to step 6 on page 362

4. Use this procedure to service the Control Panel.

The control panel (D1) will be serviced concurrently. Power should not be removed from the system during this procedure.

Go to step 6 on page 362.

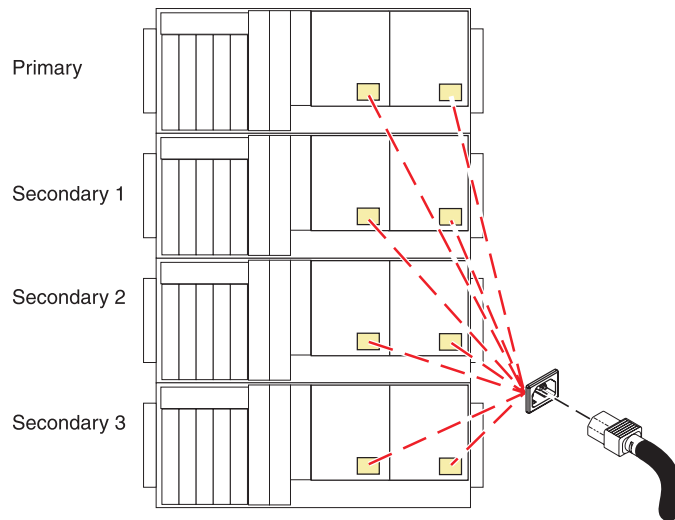
5. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

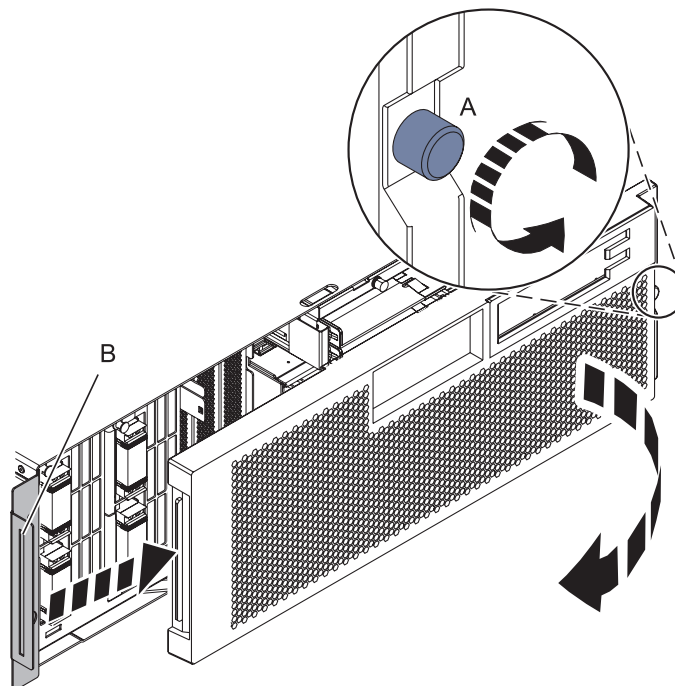
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



6. Remove the Front Cover

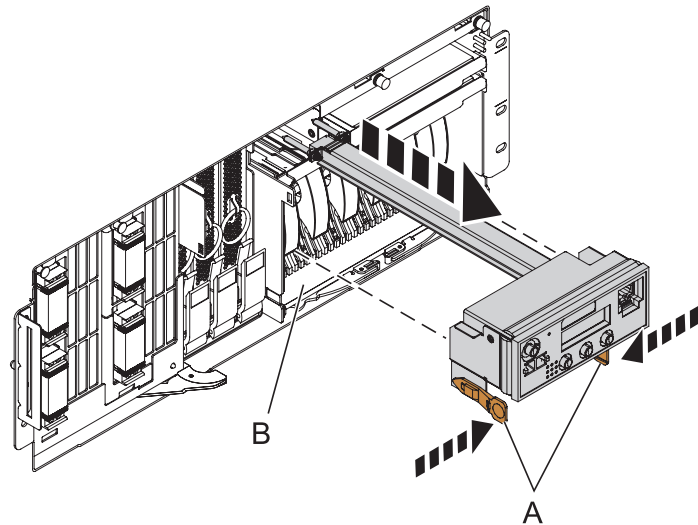
1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



Continue with the next step.

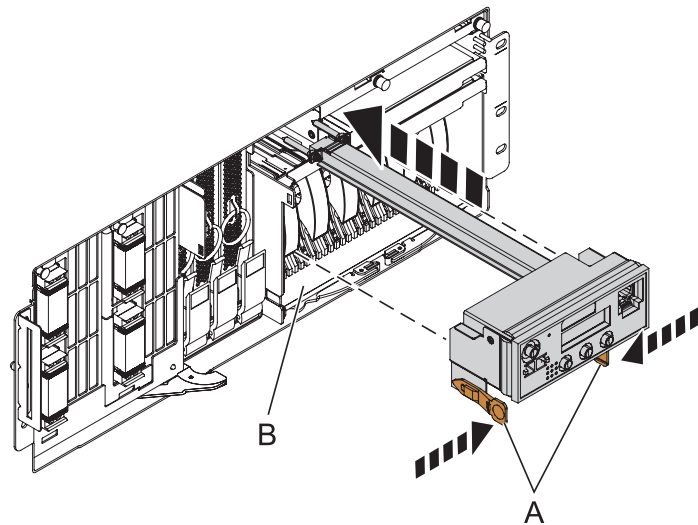
7. Remove the Control Panel

Remove the control panel by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges of the panel, and pulling it out of its bay **(B)**.



8. Install the new Control Panel

Carefully slide the control panel into the control panel bay **(B)** until you feel the locking tabs **(A)** lock in place.



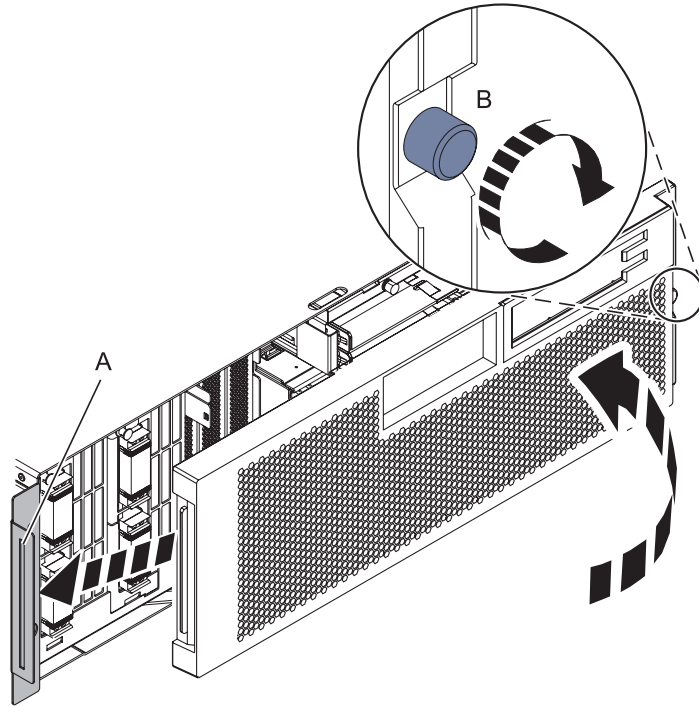
If you are performing a concurrent repair, continue with the next step. Otherwise, go to 6 on page 362.

9. Install the Control Panel

1. In the navigation area of the ASMI, expand "**Concurrent Maintenance**" then select "**Control panel**".
 2. At the Preparing the control panel window, select "Install" and click "Continue".
 3. Choose the control panel's location and click "Save Settings".
 4. If the operation was successful, the Operation completed successfully window will display.
-

10. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot (**A**) on the left side of the system unit.
2. Tighten the thumbscrew (**B**) on the right side of the cover.
3. Close the front rack door.

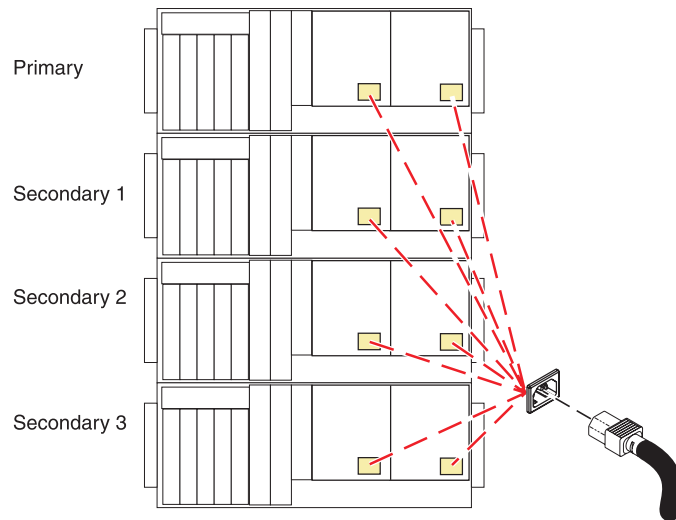


11. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



12. Verify the repair

If the power cords were disconnected to perform this procedure, reconnect them now starting with the third enclosure from the top, then the fourth enclosure, then the second enclosure and then the first (topmost) enclosure.

Ensure that the system is powered on.

Go to Chapter 5, "Verifying a repair," on page 611.

Disk Drive

Use this procedure to replace the disk drive.

Your system can be powered off or powered on when you replace the disk drive. If the system is running, you can replace a disk drive with the power on. If it is not, or if the disk drive to be replaced is in the AIX or Linux root volume group (rootvg) and it is not protected with either a redundant array of independent disks (RAID) or mirroring, use the procedure for replacing the disk drive with the power off.

1.

Do you want to replace the disk drive concurrently with system operations and the unit powered on?

Yes

↓

No

Go to “Replace the disk drive nonconcurrently” on page 378.

2.

Choose the procedure for the operating system running in the partition that the disk drive resource is assigned to.

For AIX, go to “Replace the disk drive using AIX.”

For Linux, go to “Replace the disk drive using Linux” on page 370.

For i5/OS, go to “Replace the disk drive using i5/OS” on page 407.

“Replace the disk drive using AIX”

Use this procedure to remove and replace a disk drive concurrently with AIX.

Replace the disk drive using Linux

Use this procedure to replace a disk drive in a location that is controlled by a system or logical partition that is running Linux:

“Replace the disk drive nonconcurrently” on page 378

“Rebuild data on a replacement disk drive using Linux” on page 407

To rebuild data on the replacement disk drive, complete the steps listed here.

“Replace the disk drive using i5/OS” on page 407

Use this procedure to remove and replace a disk drive Concurrently with i5/OS.

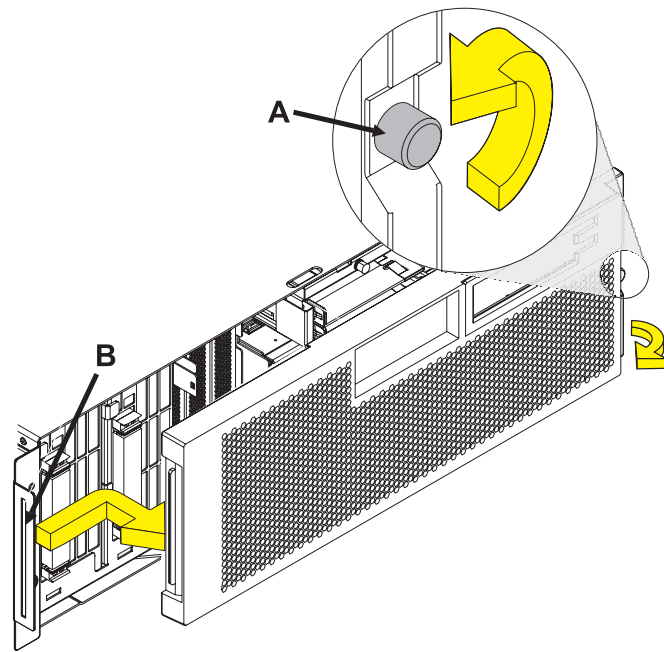
Replace the disk drive using AIX

Use this procedure to remove and replace a disk drive concurrently with AIX.

1.

Access the unit:

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



2.

Remove the disk drive as a resource:

1. Log in as root user or use CE Login.
2. At the command line, type **diag** and press Enter.
3. Press Enter to continue.
4. On the Function Selection display, select **Task Selection**.
5. Select **Hot Plug Task**.
6. Select **RAID Hot Plug Devices**.
7. Select the adapter that is connected to the array that contains the disk drive you want to replace and press Enter.
8. Select **Commit**.
9. On the Identify and Remove Resources display, select **Identify**.
10. Select the disk drive you want to remove and press Enter.

The disk drive slot enters the identify state. The concurrent maintenance light for the slot begins flashing. The following figures show the locations of the concurrent maintenance lights **A**. Verify that the flashing light corresponds to the location for the disk drive you want to remove, and press Enter.

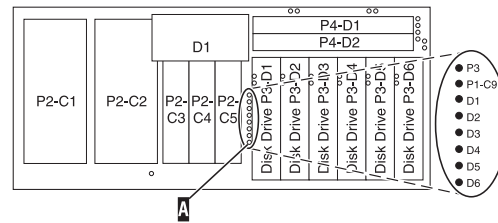
The disk drive slot exits the identify state.

11. On the Identify and Remove Resources display, select **Remove**.

A list of the disk drives that you can remove is shown. If the disk drive you want to remove does not appear on the list, ask your system administrator to put the disk drive in the failed state before continuing with this procedure. For information, see **AIX System Management Guide: Operating System and Devices**.

12. Select the disk drive you want to remove and press Enter.

The disk drive slot enters the remove state and power is removed from the slot. The concurrent maintenance light for the slot begins flashing rapidly.



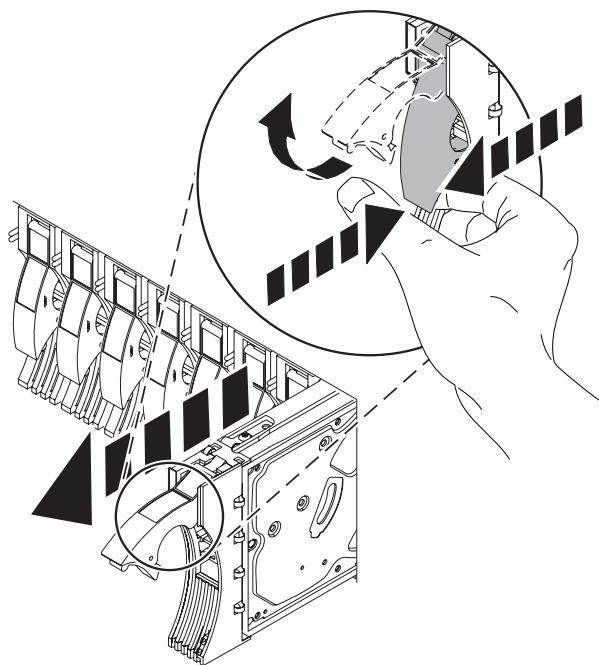
Note: If the disk drive slot is not in the remove state, contact your next level of support.

3.

Remove the disk drive by:

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

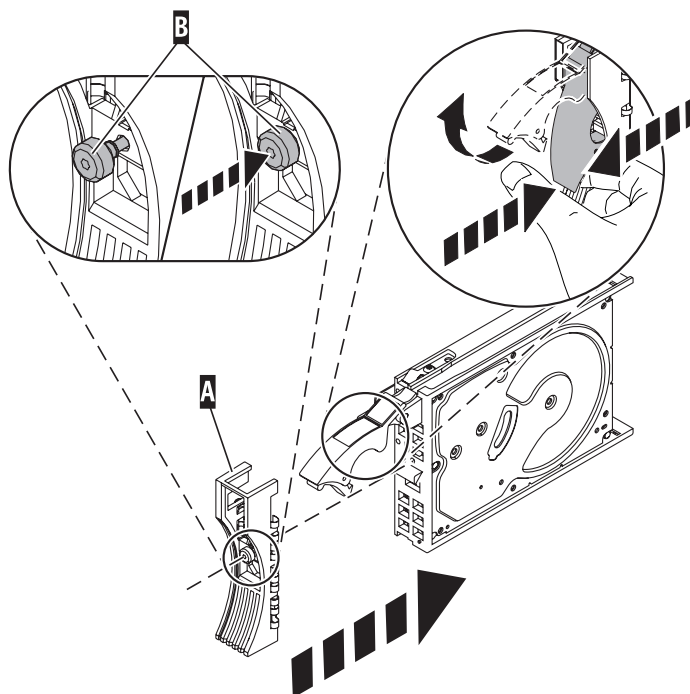
The concurrent maintenance light for the slot turns off when you remove the disk drive.



4.

Install the bezel on the new disk drive:

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel **A** to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



5.

Install the disk drive:

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
2. Slide the disk drive into the system until it stops.
3. Push the disk drive handle in until it locks.

Note: Ensure that when you install a disk drive, that the drive is fully seated and all the way into the system.

6.

Add the new disk drive as a resource:

1. Press Enter.
The disk drive slot exits the remove state and enters the normal state.
 2. Exit to the RAID Hot-Plug Devices menu. Press the F3 or ESC 3 key to return
 3. Exit to the Task selection display.
 4. Select **Log Repair Action**.
 5. Select the disk drive that you replaced and then press Enter.
 6. After you have made your selection, select **Commit** and then press Enter.
 7. Exit to the command line.
-

7.

To rebuild data on the replacement disk drive, refer to the information for the controller to which the disk drive is attached.

- If the disk drive is attached to a PCI-X SCSI RAID controller, see the *PCI-X SCSI RAID Controller Reference Guide for AIX*.
- If the disk drive is attached to a PCI SCSI RAID adapter (feature code 2498), see the *PCI 4-Channel Ultra3 SCSI RAID Adapter Reference Guide*.

For more information, see the **AIX System Management Guide: Operating System and Devices**.

8. Go to Chapter 5, “Verifying a repair,” on page 611. **This completes this procedure.**

Replace the disk drive using Linux

Use this procedure to replace a disk drive in a location that is controlled by a system or logical partition that is running Linux:

Prepare to remove the disk drive

1. Log in as root user.
2. Type `iprconfig` on the command line of the Linux session and press Enter.
The IBM Power RAID Configuration Utility display is shown.
3. Select **Analyze log**. Press Enter. The Kernel Messages Log display is shown.

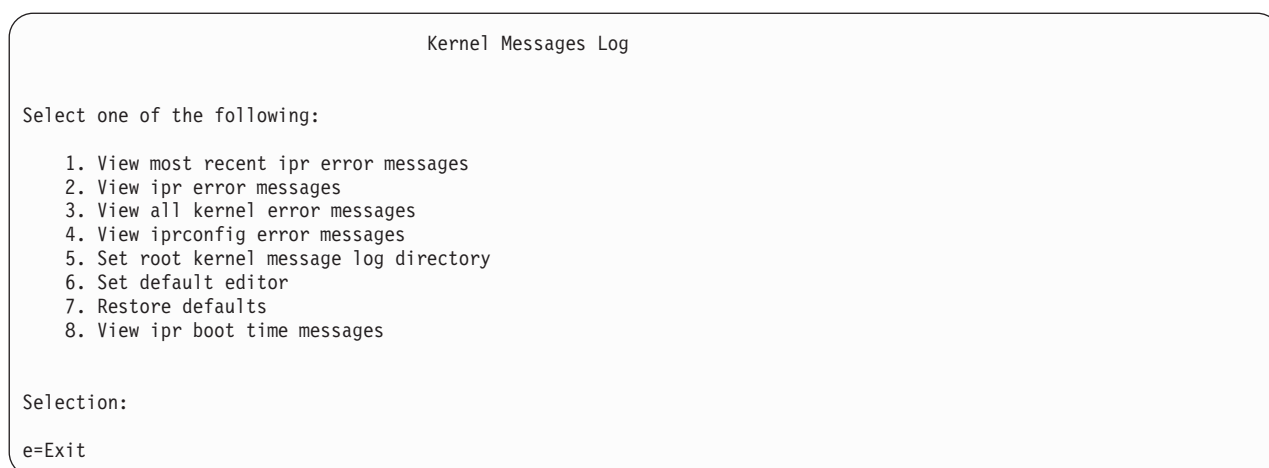


Figure 7. Kernel Messages Log

4. Select **View most recent ipr error messages** from the Kernel Messages Log display. Press Enter.
5. Find the entry in the log for the disk drive you want to replace.
6. Record the location information for the disk drive.

Note: The location information has the form of 2:0:8:0. In this example, 2 is the SCSI host number, 0 is the SCSI bus, 8 is the SCSI target ID, and 0 is the LUN (logical unit).

7. Return to the command line.
8. Type the following:
`ls -ld /sys/class/scsi_host/host#/device`
where # is the SCSI host number. Press Enter.
9. Record the PCI location information.

Note: The PCI location information has the form of 61:01:0:2.

10. Type `iprconfig` on the command line and press Enter.
The IBM Power RAID Configuration Utility display is shown.
11. Select **Display hardware status** from the IBM Power RAID Configuration Utility display. Press Enter.
The Display Hardware Status display is shown.

Display Hardware Status

Type option, press Enter.

1=Display hardware resource information details

OPT	Name	PCI/SCSI Location	Description	Status
		0000:01:01.0.0/	PCI-X SCSI Adapter	Operational
		0000:41:01.0.1/	PCI-X SCSI Adapter	Operational
sda		0000:41:01.0.1/0:3:0	Physical Disk	Active
sdb		0000:41:01.0.1/0:4:0	Physical Disk	Active
sdc		0000:41:01.0.1/0:8:0	Physical Disk	Active
sdd		0000:41:01.0.1/1:3:0	Physical Disk	Active
sde		0000:41:01.0.1/1:4:0	Physical Disk	Active
sdf		0000:41:01.0.1/1:5:0	Physical Disk	Active
		0001:61:01.0.2/	PCI-X SCSI RAID Adapter	Operational
sdg		0001:61:01.0.2/0:3:0	Physical Disk	Active
		0001:61:01.0.2/0:6:0	Advanced Function Disk	Active
sdi		0001:61:01.0.2/0:9:0	Physical Disk	Active
sdh		0001:61:01.0.2/255:0:0	RAID 10 Disk Array	Failed
		0001:61:01.0.2/0:4:0	RAID 10 Array Member	Failed
		0001:61:01.0.2/0:5:0	RAID 10 Array Member	Failed

e=Exit q=Cancel r=Refresh t=Toggle

Figure 8. Example Display Hardware Status

- Look for the disk drive at the PCI location you recorded. The disk drive might have a Failed status.
- If the disk drive you want to replace is unprotected or in use, move the data from the disk drive before continuing with this procedure.

For information, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.

- Type option **1** (Display hardware resource information details) next to the disk drive you want to replace. Press Enter.

A Disk Hardware Resource Information Details display similar to the following is shown.

Disk Unit Hardware Resource Information Details	
Manufacturer	IBM
Product ID	ST336607LC
Firmware Version	43353048 (C50H)
Serial Number.	00006719
Capacity	36.40 GB
Resource Name.	/dev/sdd
Physical location	
PCI Address.	0001:50:01.0
SCSI Host Number	2
SCSI Channel	0
SCSI Id.	4
SCSI Lun	0
Extended Details	
FRU Number	00P2676
Press Enter to Continue	
e=Exit q=Cancel f=PageDn b=PageUp	

More...

Figure 9. Example Disk Hardware Resource Information Details display

- Record the physical location information.
- Return to the IBM Power RAID Configuration Utility display.

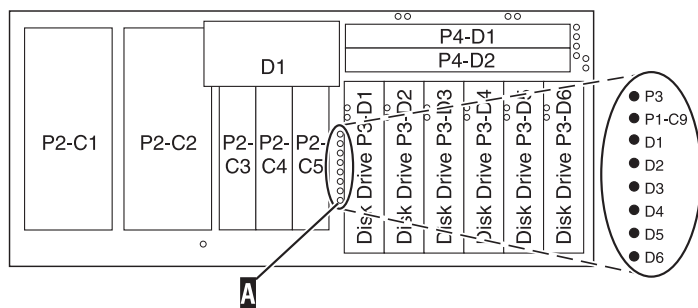
Remove the disk drive

1. From the IBM Power RAID Configuration Utility display, select **Work with disk unit recovery**. Press Enter.
2. From the Work with Disk Unit Recovery display, select **Concurrent remove device**. Press Enter. A Concurrent Device Remove display is shown, similar to the following display.

Concurrent Device Remove			
Choose a single location for remove operations 1=Select			
OPT	Name	PCI/SCSI Location	Description Status
	sdc	0000:41:01.0.1/0:8:0	Physical Disk Active
		0000:41:01.0.1/0:5:	Empty
	sdb	0000:41:01.0.1/0:4:0	Physical Disk Active
	sda	0000:41:01.0.1/0:3:0	Physical Disk Active
		0000:41:01.0.1/1:8:	Empty
	sdf	0000:41:01.0.1/1:5:0	Physical Disk Active
	sde	0000:41:01.0.1/1:4:0	Physical Disk Active
	sdd	0000:41:01.0.1/1:3:0	Physical Disk Active
		0001:61:01.0.2/0:8:	Empty
	sdh	0001:61:01.0.2/0:9:0	Physical Disk Active
	sdg	0001:61:01.0.2/0:3:0	Physical Disk Active

Figure 10. Example Concurrent Device Remove display

3. Type option 1 (Select) next to the location for the disk drive you want to replace. Press Enter.
4. The Verify Device Concurrent Remove display is shown. The concurrent maintenance light turns on for that disk drive slot.



5. On the Verify Device Concurrent Remove display, verify that the selected disk drive is the disk drive you want to replace, then press Enter. The identify light turns on for the disk drive.

Note: Ensure that the disk drive is not in use to prevent loss of data.

6. The Complete Device Concurrent Remove display is shown.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
7. Squeeze and pull the handle of the disk drive out toward you before you remove the disk drive as shown in Figure 11 on page 374 or Figure 12 on page 374. If the handle is not all the way out, the

disk drive will not slide out of the system or expansion unit.

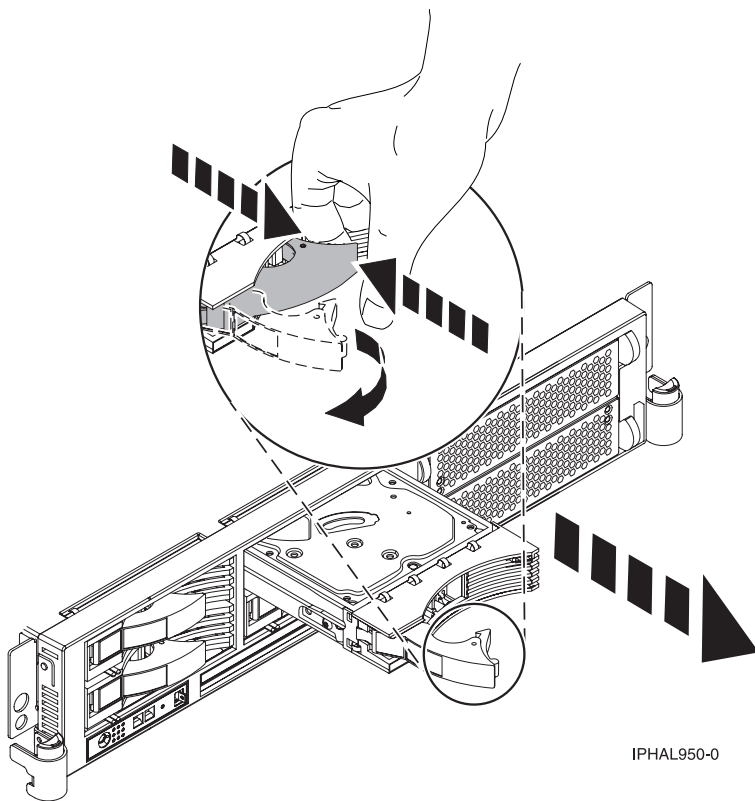


Figure 11. Removing the disk drive

OR

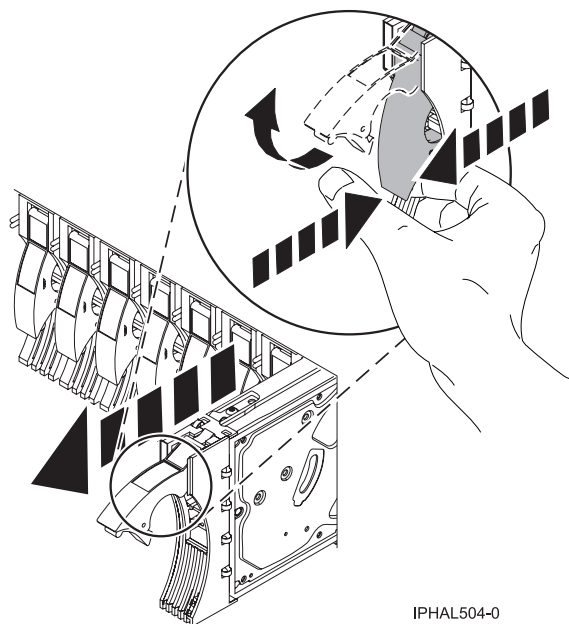
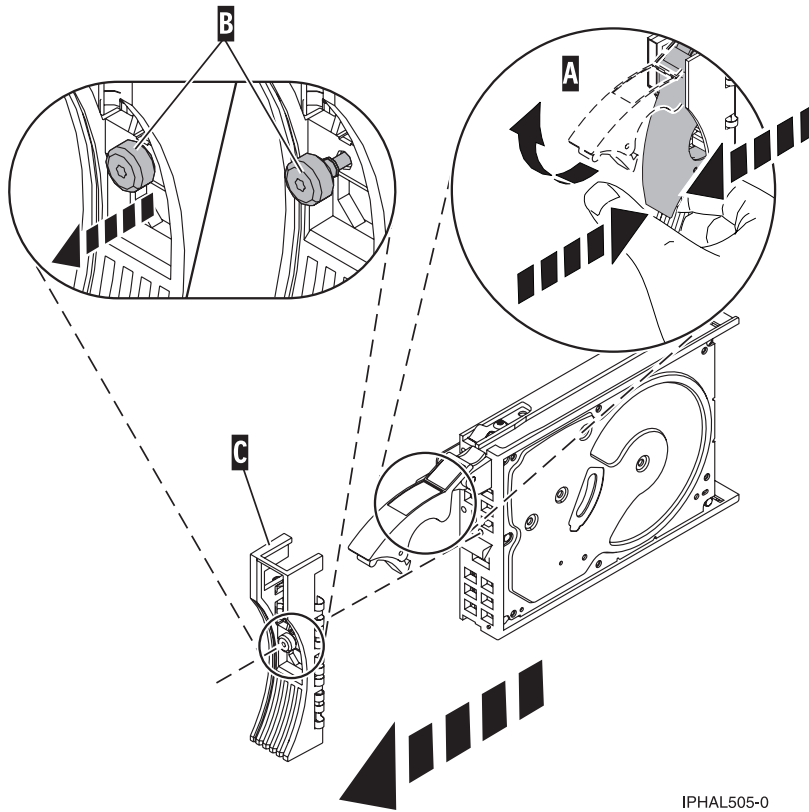


Figure 12. Removing the disk drive

8. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.
9. Loosen and pull out on the thumbscrew **B** to release the disk-drive bezel **C** from the disk drive, as shown in the following figure.



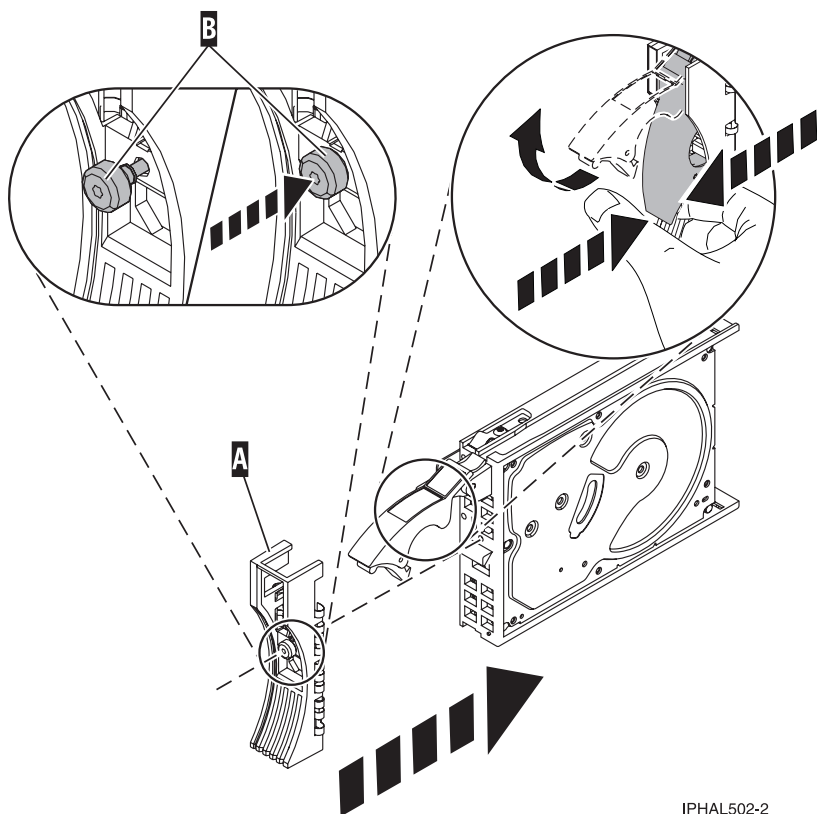
IPHAL505-0

Figure 13. Removing a disk-drive bezel

10. Press Enter on the IBM Power RAID Configuration Utility to indicate that you have removed the disk drive.

Replace the disk drive

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle them with care.
2. Remove the disk drive from its protective package.
3. Unlock the disk drive handle by squeezing and pulling it out toward you before you install the disk drive. If the handle is not all the way out, the disk drive will not slide into the system or expansion unit.
4. Follow these steps to install the disk-drive bezel on the replacement disk drive:
 - a. Attach the bezel **A** to the disk drive, as shown in the following figure.
 - b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



IPHAL502-2

Figure 14. Attaching a bezel to the disk drive

5. From the IBM Power RAID Configuration Utility display, select **Work with disk unit recovery**. Press Enter.
6. From the Work with Disk Unit Recovery display, select **Concurrent add device**. Press Enter.
A Concurrent Device Add display similar to the following is shown.

Concurrent Device Add			
Choose a single location for add operations			
1=Select			
OPT Name	PCI/SCSI Location	Description	Status
	0000:41:01.0.1/0:5:		Empty
	0000:41:01.0.1/1:8:		Empty
	0001:61:01.0.2/0:8:		Empty

Figure 15. Example Concurrent Device Add display

7. Type option **1** (Select) next to the location from which you removed the disk drive.
The Verify Device Concurrent Add display is shown.
8. Press Enter on the Verify Device Concurrent Add display. The Complete Device Concurrent Add display is shown.
9. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
10. Slide the disk drive all the way into the system or expansion unit and then lock it in place by pushing in the disk drive handle, as shown in Figure 16 on page 377 or Figure 17 on page 377.

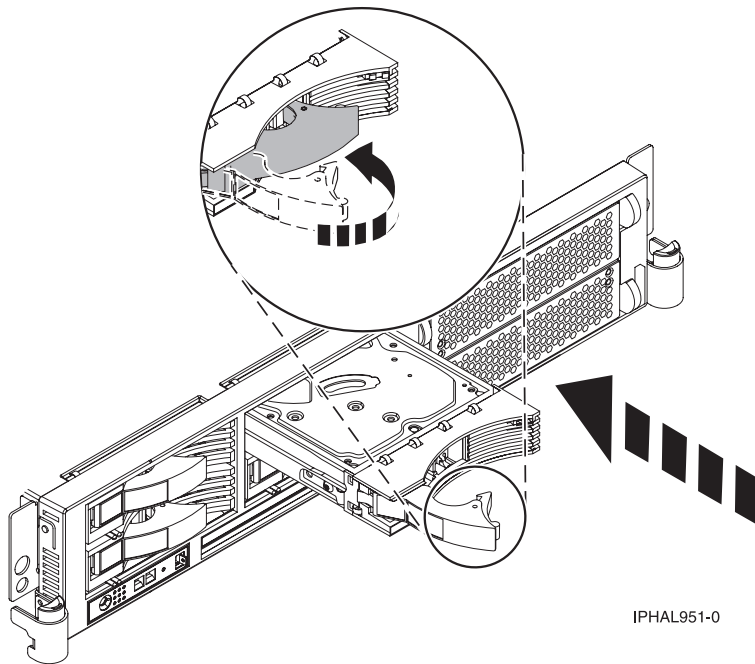


Figure 16. Locking the disk drive in place

OR

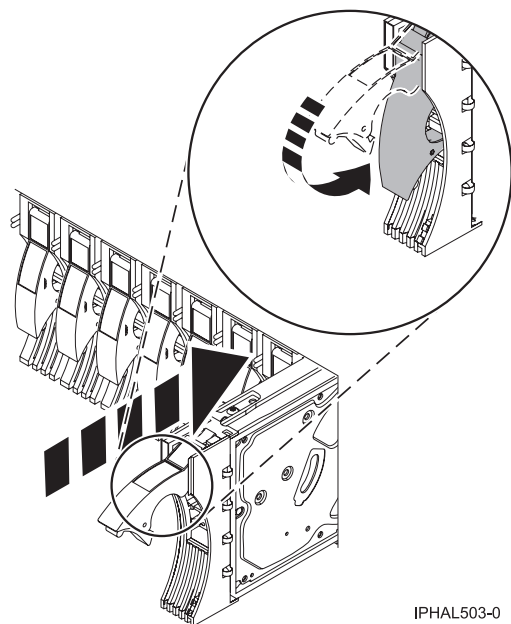


Figure 17. Locking the disk drive in place

11. Press Enter on the Complete Device Concurrent Add display to indicate that the disk drive is installed.
12. Rebuild the data on the replacement disk drive. For instructions, go to “Rebuild data on a replacement disk drive using Linux” on page 407.
13. Go to Chapter 5, “Verifying a repair,” on page 611. **This completes this procedure.**

Replace the disk drive nonconcurrently

Use this procedure to remove and replace a disk drive nonconcurrently.

Are you replacing a disk drive for an i5/OS server or partition?

No Go to 1.

Yes Perform one of the following:

- “Saving data and initializing the disk unit in i5/OS” on page 381
- “Initializing the disk unit and copying to disk in i5/OS” on page 392

1.

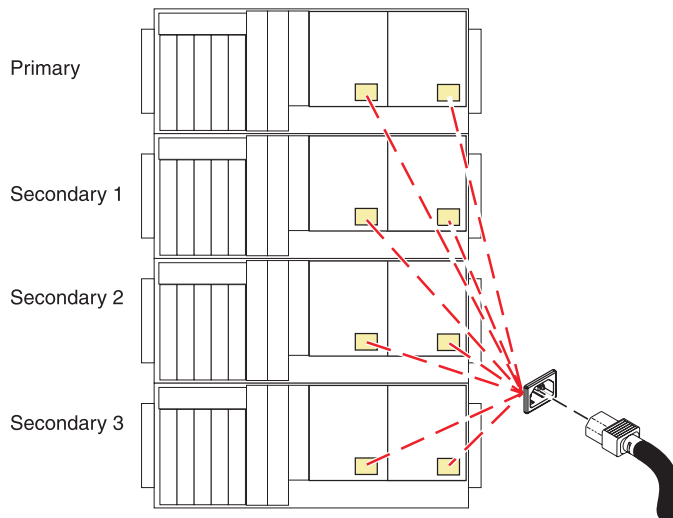
Power off the system and remove the power cords.

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

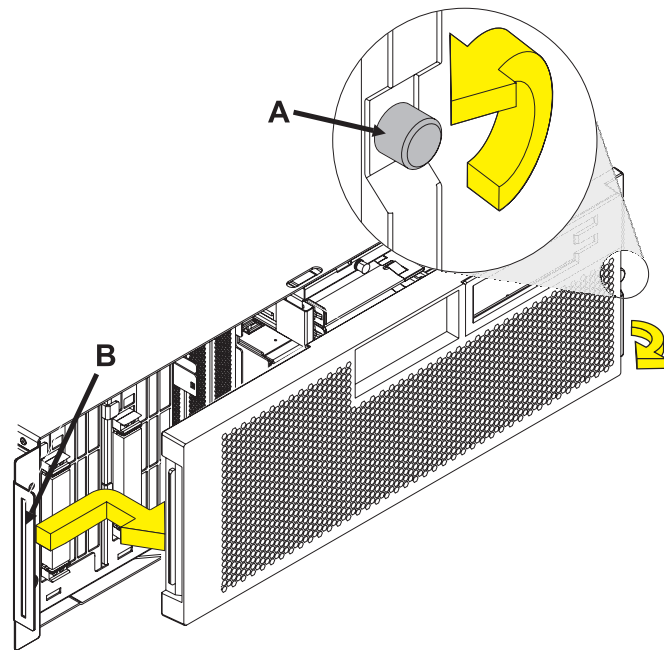
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



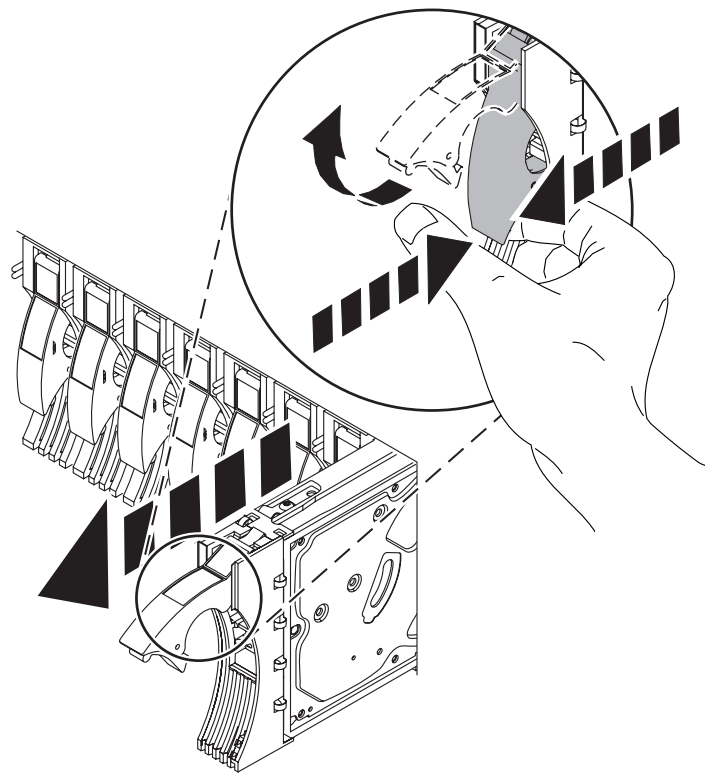
2. Access the unit.

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



3. Remove the disk drive.

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

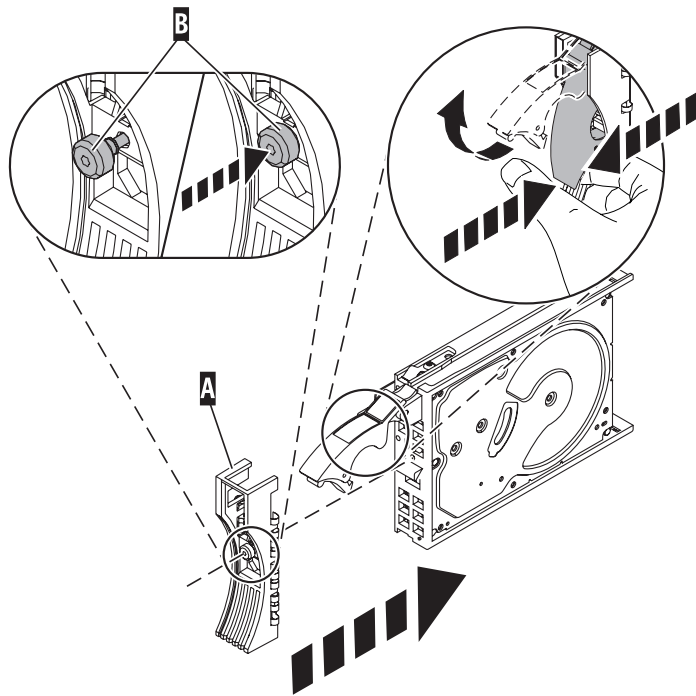


4. Install the bezel on the new disk drive.

1. Find the package that contains the new disk drive.

Attention: Disk drives are fragile. Handle with care.

2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel **A** to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



5. Install the disk drive.

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
2. Slide the disk drive into the system until it stops.
3. Push the disk drive handle in until it locks.

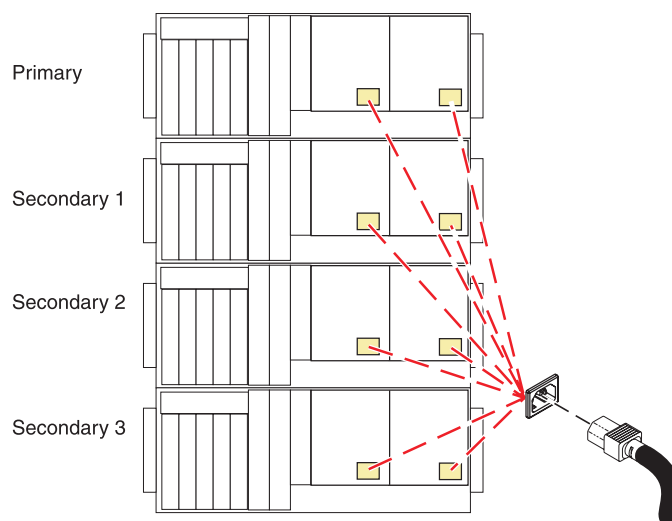
Note: Ensure that when you install a disk drive that the drive is fully seated and all the way into the system.

6. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



7. Verify the repair

Go to Chapter 5, “Verifying a repair,” on page 611. **This completes this procedure..**

“Saving data and initializing the disk unit in i5/OS”

To complete this procedure, you might need the latest set of Save System (SAVSYS) or SAVSTG tapes that were made before the problem occurred, and three blank tapes.

“Initializing the disk unit and copying to disk in i5/OS” on page 392

Use this procedure to initialize the disk unit and copy it to disk.

“Restoring profile data” on page 406

Explains how to read the profile data from the previously backed-up file on the HMC and load this data to the managed system.

Saving data and initializing the disk unit in i5/OS

To complete this procedure, you might need the latest set of Save System (SAVSYS) or SAVSTG tapes that were made before the problem occurred, and three blank tapes.

To complete this procedure, you might need the latest set of Save System (SAVSYS) or SAVSTG tapes that were made before the problem occurred. You will also need three blank tapes.

1. Are you exchanging a disk unit because a disk unit failure caused system operations to stop completely?

Yes: Continue with the next step.

No: You may be able to use the Remove Units from Configuration function of DST. This function allows you to move all data from the disk unit you want to exchange to the other disk units in the same auxiliary storage pool (ASP). Go to step 20 on page 388.

2. Perform an IPL to Dedicated Service Tools (DST) (see “Performing an IPL to DST” on page 695). Does the Use Dedicated Service Tools (DST) display appear?

Yes: Go to step 5 on page 382.

No: Continue with the next step.

3. Did any messages regarding missing disk units appear?
Yes: Ignore the messages and go to step 5.
No: Continue with the next step.
4. Repeat step 2 on page 381. Does the same SRC occur again?
Yes: The customer data is not recoverable. Go to step 7.
No: Use the new SRC to correct the problem. **This ends the procedure.**
5. From the Use Dedicated Service Tools (DST) display, perform the following to save the customer data from the failing disk unit:
 - a. Select **Work with disk units** → **Work with disk unit recovery** → **Save disk unit data**.
 - b. On the Select Disk Unit Data to Save display, select the disk unit from which you want to save the data. Record the ASP of the disk unit that you are saving.

Note: If the disk unit is missing, you cannot save the customer data to tape at this time. Go to step 7.
 - c. Install a tape in the tape unit. The Specify Volume Identifier prompt appears.
 - d. Enter the volume identifier for the tape. Write down the tape volume identifier. You will use the tape volume identifier later in this procedure. The Select Tape Unit prompt appears.
 - e. Select the tape unit that you loaded with a tape. The Function Status display shows the percent of disk data saved.

Note: If the tape volume identifier that you entered does not match the tape volume identifier on the tape you loaded, the Device Intervention Required prompt appears. The message "Wrong volume loaded" appears at the bottom of the display. Select the Format option and press **Enter** to continue the save operation.
 - f. If the tape is full, the Device Intervention display appears. The message "Load next volume" appears at the bottom of the display. Insert the next tape into the tape unit and select the option to retry, and then press **Enter** to continue the save operation.
 - g. Continue saving the disk unit data until the status of the save is complete.

Note: Customer data is not recoverable if one of the following occurs:
 - The copy operation does not complete.
 - A large number of unreadable pages must be copied from the disk unit.
6. Does the display show that the status of the save is complete?
No: Continue with the next step.
Yes: Go to step 8.
7. Have you already exchanged the storage IOA?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following:
 - a. Power off the system.
 - b. Exchange the storage IOA (see Chapter 3, "Locating FRUs," on page 347). If you do not know the part number, see Chapter 8, "Part Information," on page 741.
 - c. Perform an IPL to Dedicated Service Tools (DST) (see "Performing an IPL to DST" on page 695).
 - d. Choose from the following:
 - If the same SRC occurs, go to step 8.
 - If a different SRC occurs, use it to correct the problem.
 - If no SRC occurs, then the problem has been resolved. **This ends the procedure.**
8. Power off the system and exchange the failing disk unit.

a.

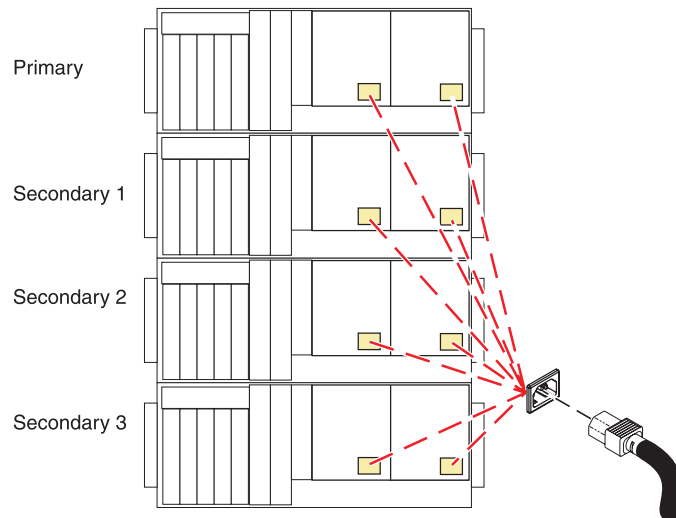
Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

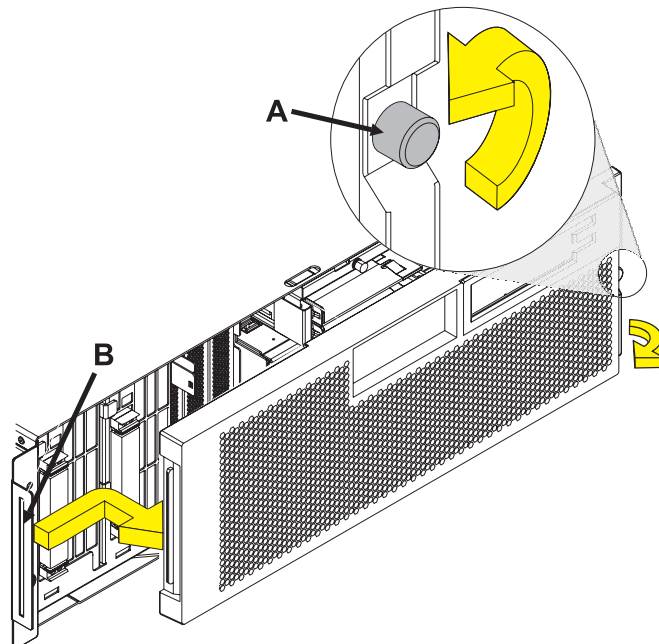
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



b. Access the unit.

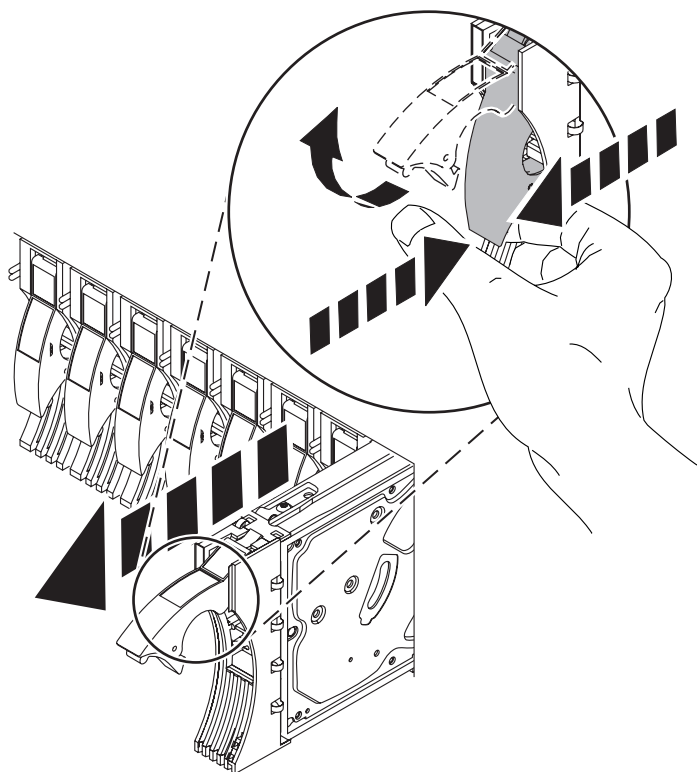
1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



c. Remove the disk drive.

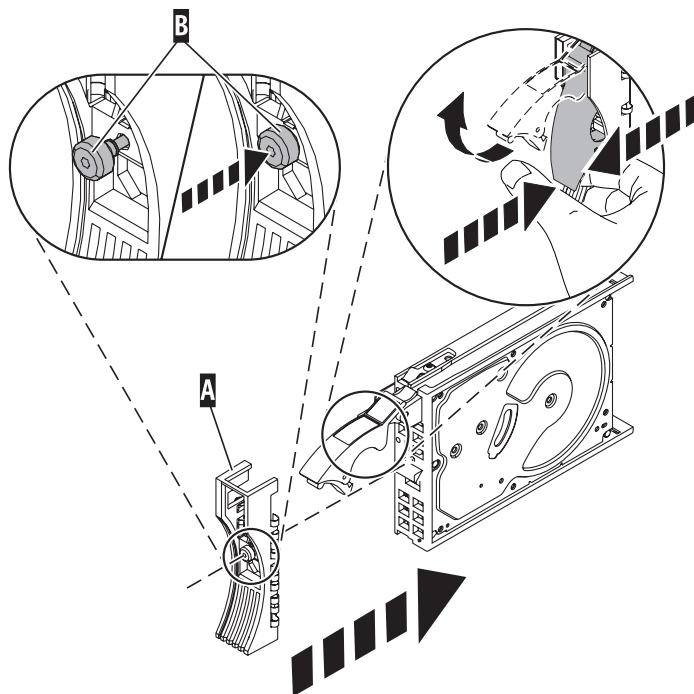
1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

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



d. Install the bezel on the new disk drive.

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel **A** to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



e. Install the disk drive.

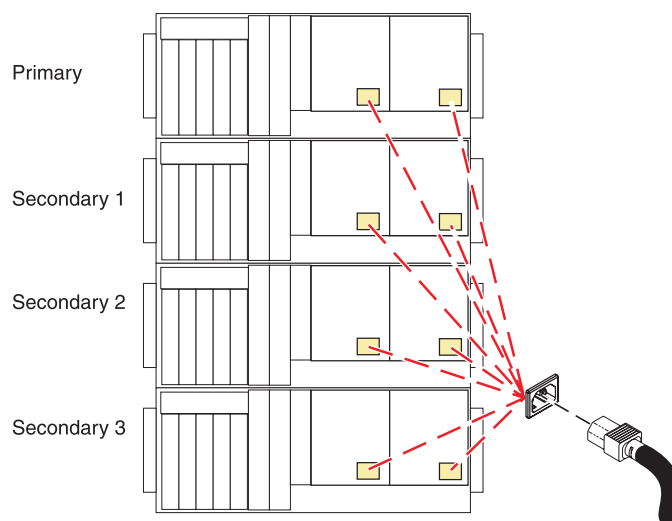
1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
 2. Slide the disk drive into the system until it stops.
 3. Push the disk drive handle in until it locks.
- Note:** It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.

f. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



9. Did you just exchange disk unit 1 in the system unit?
 - **Yes:** Go to step 11 on page 386.
 - **No:** Format and initialize the new disk unit by performing the following:
 - a. Perform an IPL to DST (see “Performing an IPL to DST” on page 695). You may ignore any messages regarding missing disk units.
 - b. From the Use Dedicated Service Tools (DST) display, select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures** → **Initialize and format disk unit**.
 - c. Select the disk unit you wish to initialize and format.
 - d. Press **F10** on the confirmation display. The system formats and initializes the new disk unit. The display shows when the status is complete (this may take 30 minutes or longer). Continue with the next step.
10. Is most of the customer data recoverable (see step 5 on page 382)?
 - **No:** Go to step 18 on page 387.
 - **Yes:** Restore the customer data from the tape to the new disk unit by performing the following:
 - a. Return to the Work With Disk Unit Recovery display and select **Restore disk unit data**.
 - b. Enter the tape volume identifier. This is the volume identifier that you entered during the save procedure.
 - c. Install into the tape unit the first tape that the data was saved to.

- d. On the Select Tape Unit display, select the tape unit that you want the data restored from.
- e. On the Restore Disk Unit Data display, select the disk unit on which you want to restore the data.
- f. Press **F10** to confirm the restore. The Function Status display shows the percentage of customer data restored. The system will IPL to the Use Dedicated Service Tools (DST) display when the restore has completed.

Note: Any damaged objects that were restored must be loaded again by the customer. Refer the customer to *Backup and Recovery*, SC41-5304.

- g. The system is ready for the next IPL. **This ends the procedure.**

11. Is the customer data recoverable (see step 5 on page 382)?

No: Go to step 14 on page 387.

Yes: Perform an IPL from removable media and select the option to install Licensed Internal Code and restore disk unit data. See *Operations Guide for the Hardware Management Console and Managed Systems*, SA76-0085. Then continue with the next step.

12. Did you get a Disk Configuration Error Report with a *Unit has incorrect logical partition configuration* warning?

- **No:** Continue with the next step.
- **Yes:** You have logical partitions that need to be recovered before you can continue with this disk unit recovery procedure. Perform the following:
 - a. Select the **Use Dedicated Service Tools (DST)** option from the IPL or Install the System display.
 - b. Enter the password 22222222. If this password is not valid, ask the customer for the correct password.
 - c. From the Use Dedicated Service Tools (DST) display, select **Work with system partitions** → **Recover configuration data** → **Recover primary partition configuration data**.
 - d. Review the information on the Select Disk Unit for Configuration Data Recovery display. Select the disk unit with the most recent date and the correct system serial number, and then press **Enter**. The system automatically copies the configuration data to the primary partition's load source, and performs an IPL. Continue with the next step.

13. Restore the customer data from the tape to the new disk unit by performing the following:

- a. Select **Use Dedicated Service Tools (DST)** from the IPL or Install the System display.
- b. Enter the password 22222222. If this password is not valid, ask the customer for the correct password.
- c. From the Use Dedicated Service Tools (DST) display, select **Work with disk units** → **Work with disk unit recovery** → **Restore disk unit data**.
- d. Enter the tape volume identifier. This is the volume identifier that you entered during the save procedure.
- e. Install the first tape to which the data was saved in the tape unit.
- f. On the Select Tape Unit display, select the tape unit that you want the data restored from.
- g. On the Restore Disk Unit Data display, select the disk unit on which you want to restore the data.
- h. Press **F10** to confirm the restore. The Function Status display shows the percentage of customer data restored.

Note: When the load-source disk is restored, the system automatically performs an IPL to the Use Dedicated Service Tools (DST) display. This occurs after the restore operation completes.

- i. When all customer data from the tape to the disk restores successfully, the display shows that the status of the restore operation as complete. Press **Enter** to complete the restore operation.
- j. Power off the system.

Note: Any damaged objects that were restored must be loaded again by the customer. Refer the customer to *Backup and Recovery*, SC41-5304.

- k. The system is ready for the next IPL. **This ends the procedure.**
14. Perform an IPL from removable media and select the option to install Licensed Internal Code and recover configuration. See *Operations Guide for the Hardware Management Console and Managed Systems*, SA76-0085. Then continue with the next step.
15. Did you get a Disk Configuration Error Report with a *Unit has incorrect logical partition configuration* warning?
 - **No:** Continue with the next step.
 - **Yes:** You have logical partitions that need to be recovered before you can continue with this disk unit recovery procedure. Perform the following:
 - a. Enter **Use Dedicated Service Tools (DST)** from the IPL or Install the System display.
 - b. Enter the password 22222222. If this password is not valid, ask the customer for the correct password.
 - c. From the Use Dedicated Service Tools (DST) display, select **Work with system partitions** → **Recover configuration data** → **Recover primary partition configuration data**.
 - d. Review the information on the Select Disk Unit for Configuration Data Recovery display. Select the disk unit with the most recent date and the correct system serial number, and then press **Enter**. The system will automatically copy the configuration data to the primary partition's load source, and then perform an IPL. Continue with the next step.
16. The system ASP will be cleared because customer data was not recoverable. Recover the configuration to disk unit 1 in the system unit by performing the following:
 - a. Enter **Use Dedicated Service Tools (DST)** from the IPL or Install the System display.
 - b. Enter the password 22222222. If this password is not valid, ask the customer for the correct password.
 - c. From the Use Dedicated Service Tools (DST) display, select **Work with disk units** → **Work with disk unit recovery**.
 - d. Select **Recover configuration** on the Work with Disk Unit Recovery display. This option assembles the system configuration information on disk unit 1 in the system unit. Continue with the next step.

Note: A warning message will appear stating that recovering the configuration destroys all system data.
17. Did a message appear stating that your request to recover the configuration was not successful?
 - Yes:** You are working on a system with only one disk unit, and the recover configuration function cannot be performed with only one disk unit. Go to step 18.
 - No:** Go to step 19 on page 388.
18. Because the disk data was not recoverable, clear the auxiliary storage pool (ASP) to which the disk unit is assigned by performing the following:
 - a. Return to the Work with Disk Units display. Select **Work with disk configuration** → **Work with ASP configuration** → **Delete ASP data**.
 - b. Enter the **Delete** option for the ASP that you recorded in step 5 on page 382, and confirm the deletion.
 - c. Return to the Work with Disk Units display, and select **Work with disk unit recovery** → **Replace configured unit**.
 - d. On the Select Configured Unit to Replace display, select the configured disk unit to exchange.
 - e. On the Select Replacement Unit display, select the new disk unit.

- f. Press **Enter** to confirm the replace operation (this operation takes 10 to 15 minutes to complete). **This ends the procedure.** The auxiliary storage pool to which the disk unit is assigned was erased. The customer must restore the data to the auxiliary storage pool. Refer the customer to *Backup and Recovery*, SC41-5304.
19. The ASP to which the failing disk unit was assigned was erased. The customer should perform one of the following:
- If the disk unit you exchanged is in ASP 1, refer the customer to *Backup and Recovery*, SC41-5304, to restore the operating system and all customer data. **This ends the procedure.**
 - If the disk unit is in a user ASP (ASP 2 through ASP 16), data in the ASP is lost. See *Backup and Recovery*, SC41-5304. **This ends the procedure.**
20. The remaining steps of this procedure require a dedicated system. Have the customer do a normal power-off procedure of the system. Then continue with the next step.
21. Perform an IPL to DST (see “Performing an IPL to DST” on page 695). Is the IPL or Install the System display shown, or is DST available?
- No:** Go to step 2 on page 381.
- Yes:** Select **Use dedicated service tools (DST)** on the display or use a function key. Have the customer enter their password to get to the Use Dedicated Service Tools (DST) display. Continue with the next step.
22. Perform the following:
- a. From the Use Dedicated Service Tools (DST) display, select **Work with disk units** → **Work with disk configuration** → **Display disk configuration** → **Display disk configuration status**.
 - b. Record the ASP, unit, serial number, type, and resource name of the disk unit.
 - c. On the Display Disk Configuration Status display, ensure the following:
 - The disk unit is not the load-source disk unit (disk unit 1).
 - No disk units are missing from the configuration (indicated by an asterisk (*) next to the unit number).
 - The status field of the disk unit to be removed shows *Configured*.
- Are all of the above conditions true?
- Yes:** Continue with the next step.
- No:** You cannot use the Remove Units from Configuration function. Go to step 2 on page 381.
23. Return to the Display Disk Configuration display and select **Display disk configuration capacity**. Does the % *Used* field for the disk unit to be removed show an asterisk (*)?
- No:** Continue with the next step.
- Yes:** You cannot use the Remove Units from Configuration function. Go to step 2 on page 381.
24. Return to the Work with Disk Units display and perform the following:
- a. Select **Work with disk unit recovery** → **Disk unit problem recovery procedures** → **Analyze disk unit surface**.
 - b. Select the disk unit to analyze.
 - c. Press **F10** to analyze the disk unit surface.
 - d. Wait until the Analyze function is complete. This will take several minutes.
- Are there any pages with errors?
- No:** Continue with the next step.
- Yes:** You cannot use the Remove Units from Configuration function. Go to step 2 on page 381.
25. Return to the Work with Disk Units display and perform the following:
- a. Select **Work with disk configuration** → **Work with ASP configuration** → **Remove units from configuration**.
 - b. Select the disk unit to be removed. If the disk unit does not display, go to step 2 on page 381.
 - c. If the Confirm Continuation display appears, press **Enter** to continue. Wait for the next display.

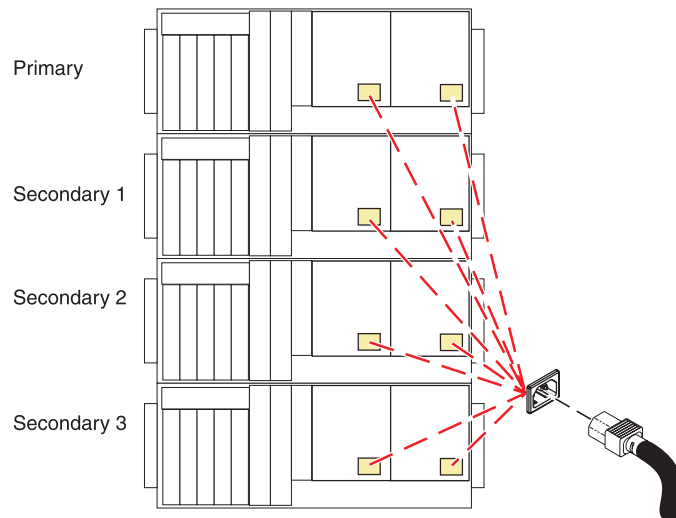
- d. If there is enough storage in the ASP, the Confirm Remove Disk Units display appears. If there is not enough storage, an error message display appears. Does any error message display appear?
- No:** Continue with the next step.
- Yes:** Go to step 2 on page 381.
26. Press **Enter** to verify the Remove Disk Units function. The Remove Disk Units function takes several minutes. When it is complete, a message will appear stating whether it was successful. Was the Remove Disk Units function successful?
- Yes:** Continue with the next step.
- No:** Go to step 2 on page 381.
27. On the Work with ASP Configuration display, select **Display disk configuration capacity**. Press **F11** twice to display non-configured units. Is the unit you removed shown as a non-configured unit?
- Yes:** Continue with the next step.
- No:** Go to step 2 on page 381.
28. You can exchange the disk unit at a later time because the disk unit is removed from the configuration. Do you want to exchange the disk unit now?
- Yes:** Continue with the next step.
- No:** **This ends the procedure.**
29. Power off the system and exchange the failing disk unit.
- a.
- Power off the system and remove the power cords.

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

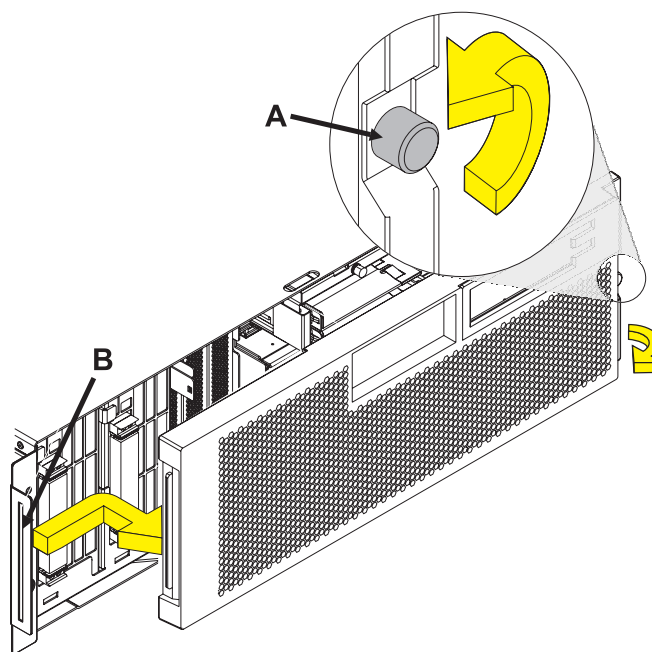
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



b. Access the unit.

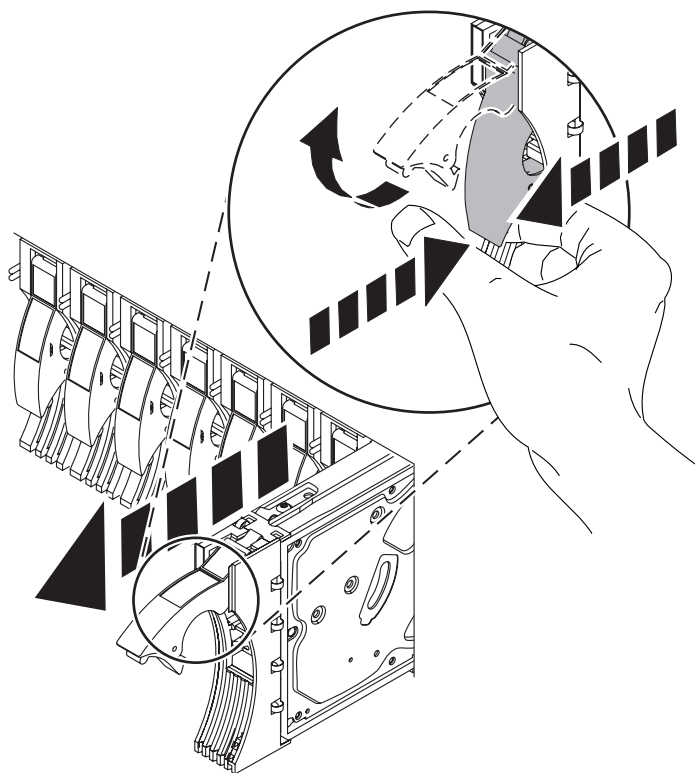
1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



c. Remove the disk drive.

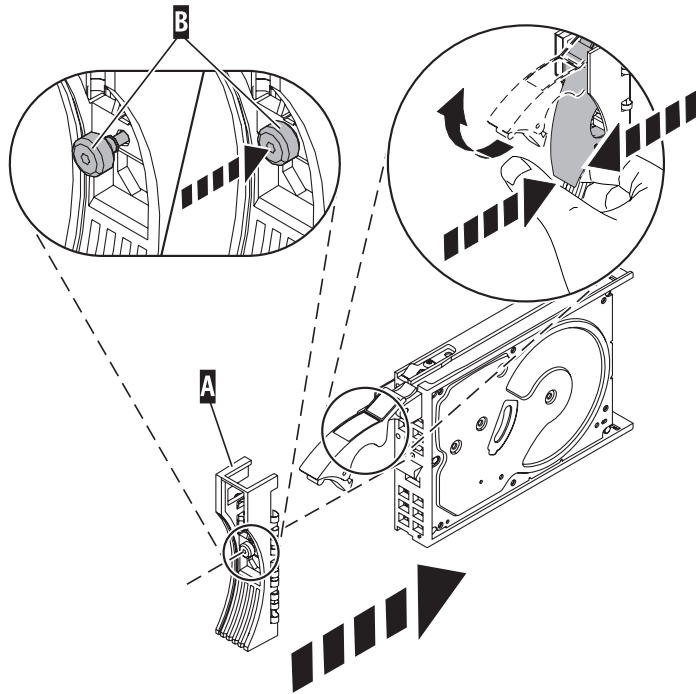
1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

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



d. Install the bezel on the new disk drive.

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel **A** to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



e. Install the disk drive.

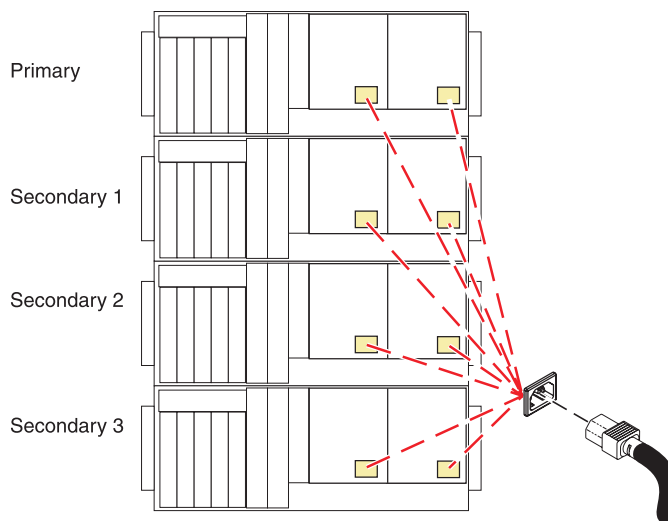
1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
 2. Slide the disk drive into the system until it stops.
 3. Push the disk drive handle in until it locks.
Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.
-

- f. Install the power cords.

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



30. Format and initialize the new disk unit by doing the following:
 - a. Perform an IPL to DST (see “Performing an IPL to DST” on page 695).
 - b. From the Use Dedicated Service Tools (DST) display, select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures** → **Initialize and format disk unit**.
 - c. Select the disk unit you wish to initialize and format.
 - d. Press **F10** on the confirmation display.
 - e. The system initializes and formats the new disk unit. The display shows when the status is complete (this may take 30 minutes or longer). Continue with the next step.
31. In this step, you use the ASP, unit, serial number, type, and resource name information that you recorded in step 22 on page 388. Perform the following:
 - a. Return to the Work with Disk Units display and select **Work with disk configuration** → **Work with ASP configuration** → **Add units to ASPs**.
 - b. Specify the ASP from which the disk units were removed.
 - c. Select the unit to add to the ASP.
 - d. When the Confirm Add Units display appears, press **Enter** to continue. Wait for the next display.
32. The Add Disk Units function takes several minutes. When it is complete, a message appears stating whether it was successful. Was the Add Disk Units function successful?

No: Continue with the next step.

Yes: On the Work with ASP Configuration display, select **Display disk configuration capacity**. The unit you that added should be shown in the correct ASP. **This ends the procedure.**
33. Do you have more field replaceable units (FRUs) to exchange?

Yes: Go to step 29 on page 389.

No: Ask your next level of support for assistance. **This ends the procedure.**

Initializing the disk unit and copying to disk in i5/OS

Use this procedure to initialize the disk unit and copy it to disk.

1. Perform an IPL to Dedicated Service Tools (DST) (see “Performing an IPL to DST” on page 695). Does the Use Dedicated Service Tools (DST) display appear?
 - **Yes:** Continue with the next step.
 - **No:** Repeat this step and then choose one of the following:
 - If the same system reference code (SRC) occurs again, the customer data is not recoverable. Go to step 12 on page 400.
 - If a different SRC occurs , use the new SRC to correct the problem. **This ends the procedure.**
2. Is this a single disk unit system?
 - No:** Continue with the next step.
 - Yes:** Perform “Saving data and initializing the disk unit in i5/OS” on page 381. **This ends the procedure.**
3. Disk unit 1 contains the load-source disk unit. Is the failing disk unit the load-source disk unit?
 - Yes:** Continue with the next step.
 - No:** Go to step 17 on page 402.
4. Find another disk unit on the system and perform the following to install the new disk unit.

Note: Be very careful with the disk unit you remove. You will install it again when the service actions to the failing load-source disk unit are complete.

a.

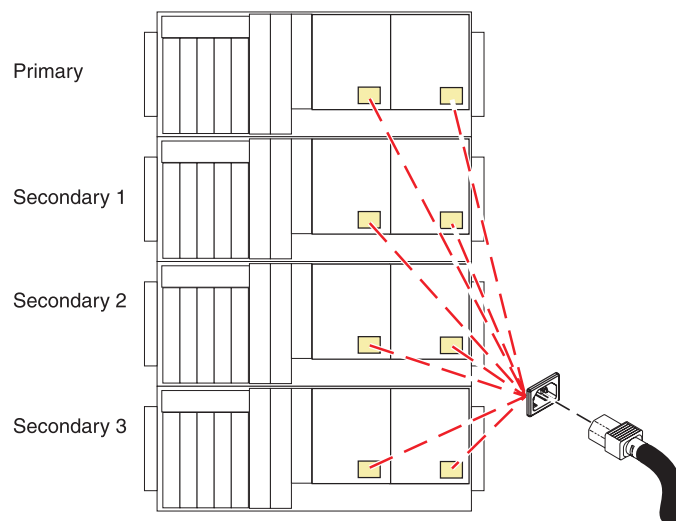
Power off the system and remove the power cords.

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

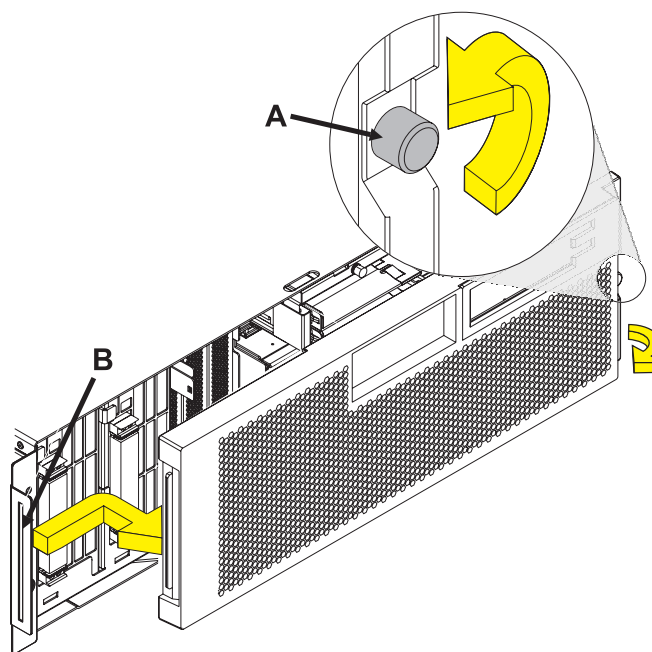
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



b. Access the unit.

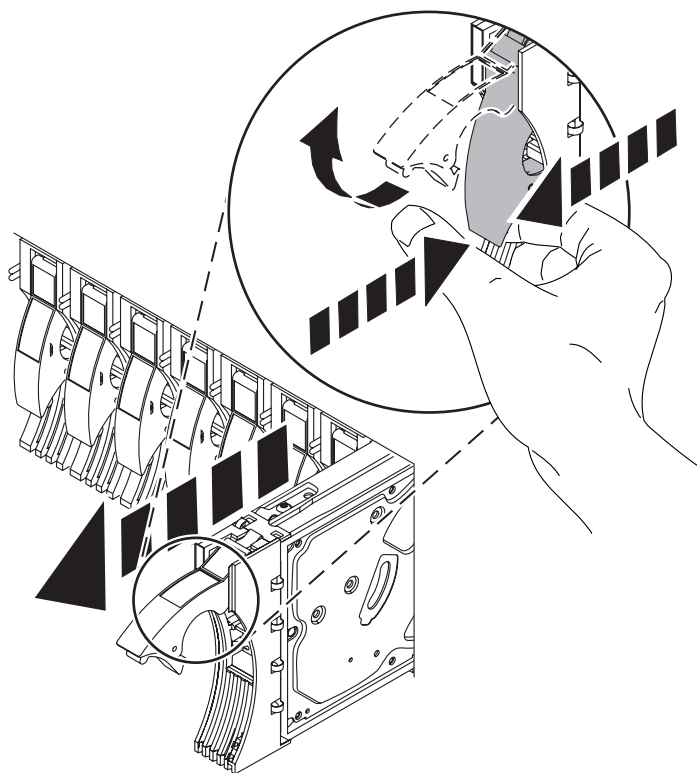
1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



c. Remove the disk drive.

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

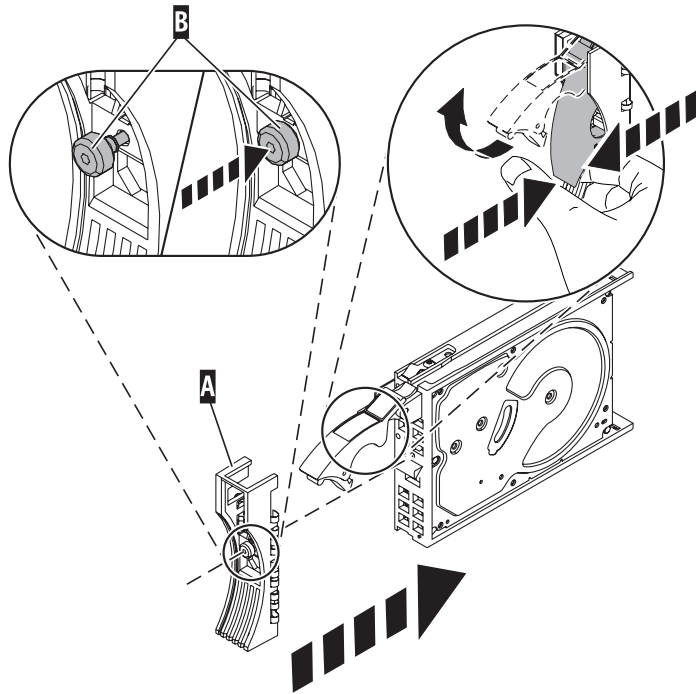
The concurrent maintenance light for the slot turns off when you remove the disk drive.



d.

Install the bezel on the new disk drive.

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel **A** to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



e. Install the disk drive.

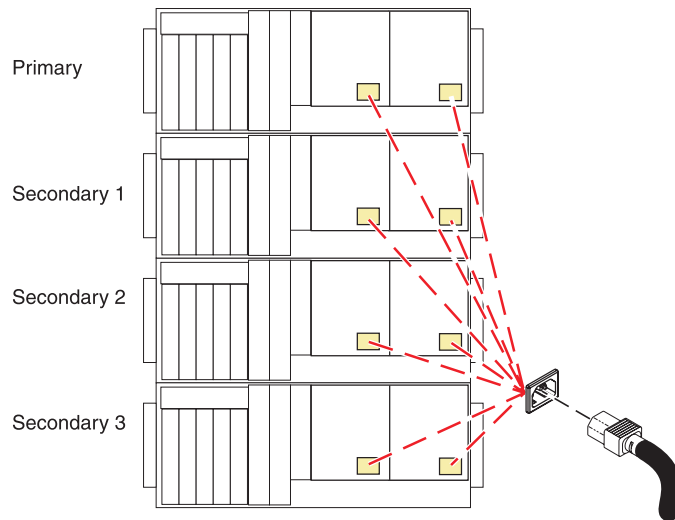
1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
 2. Slide the disk drive into the system until it stops.
 3. Push the disk drive handle in until it locks.
Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.
-

- f. Install the power cords.

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



5. Perform an IPL to DST (see “Performing an IPL to DST” on page 695). Does the Use Dedicated Service Tools (DST) display appear?
 - Yes:** Continue with the next step.
 - No:** Repeat step 1 on page 393.
6. Perform the following to format and initialize the disk drive that you installed in step 4 on page 393:
 - a. From the Use Dedicated Service Tools (DST) display, select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures** → **Initialize and format disk unit**.
 - b. Select the unconfigured unit that you installed in step 4 on page 393 as the unit to work with.
 - c. Press F10 to verify the initialization and formatting. The initialization and formatting may take 30 minutes or longer to complete.
7. Perform the following to copy data from the load-source disk unit to the disk drive you installed in step 4 on page 393:
 - a. Return to the Work with Disk Unit Recovery display.
 - b. Select **Copy disk unit data**.
 - c. Select the load-source disk unit (disk unit 1) as the unit to copy.
 - d. Select the unconfigured unit that you installed in step 4 on page 393 as the unit to copy to.
 - e. The console displays the percentage of the data copied. Write down the number of unreadable pages if it displays; you will use it later in this procedure.
 - f. Wait until the status of the copy is *Complete*. Customer data is not recoverable if one of the following occurs:
 - The copy operation does not complete.
 - There is a large number of unreadable pages to copy from the disk unit.
8. Perform the following to remove the failing load-source disk unit from the system:
 - a.

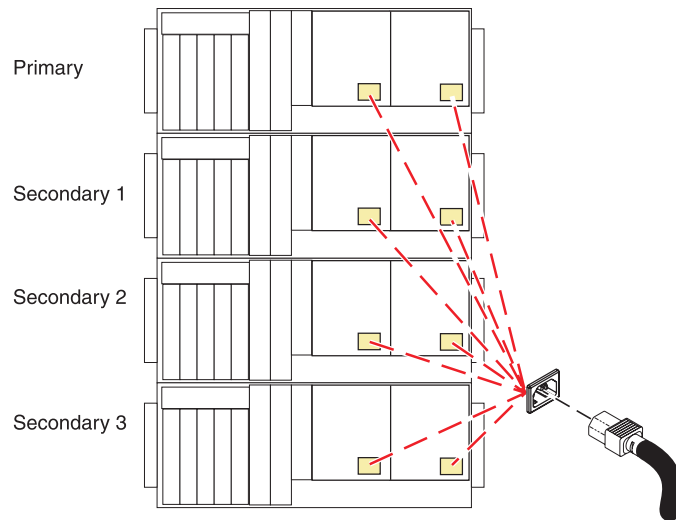
Power off the system and remove the power cords.

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

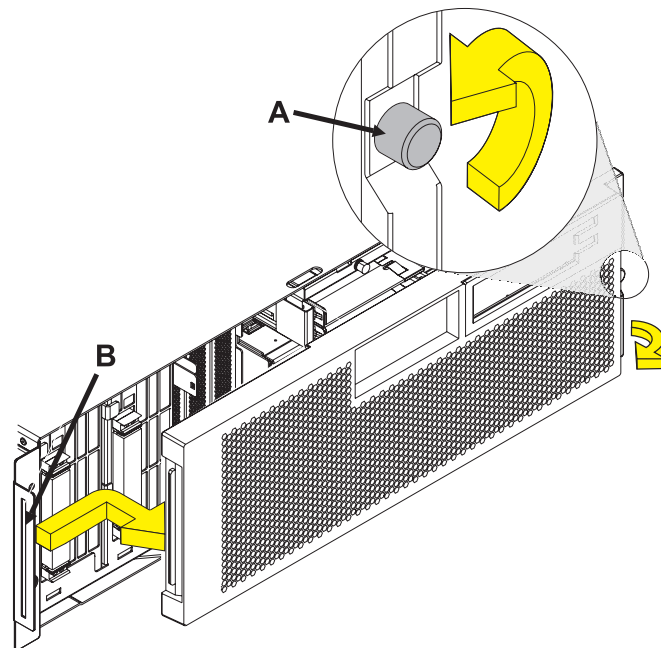
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



b. Access the unit.

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



c.

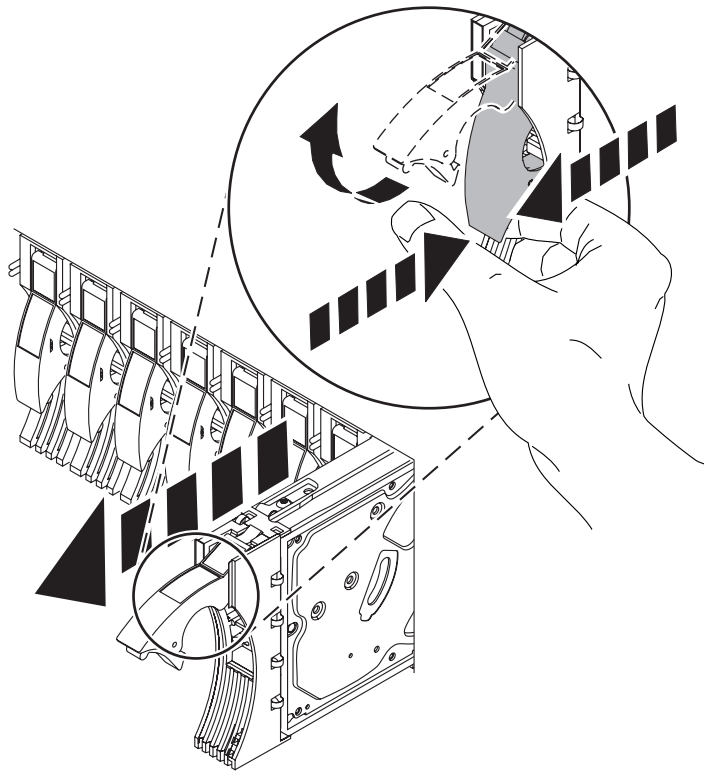
Find the load-source disk unit.

d.

Remove the disk drive.

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

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



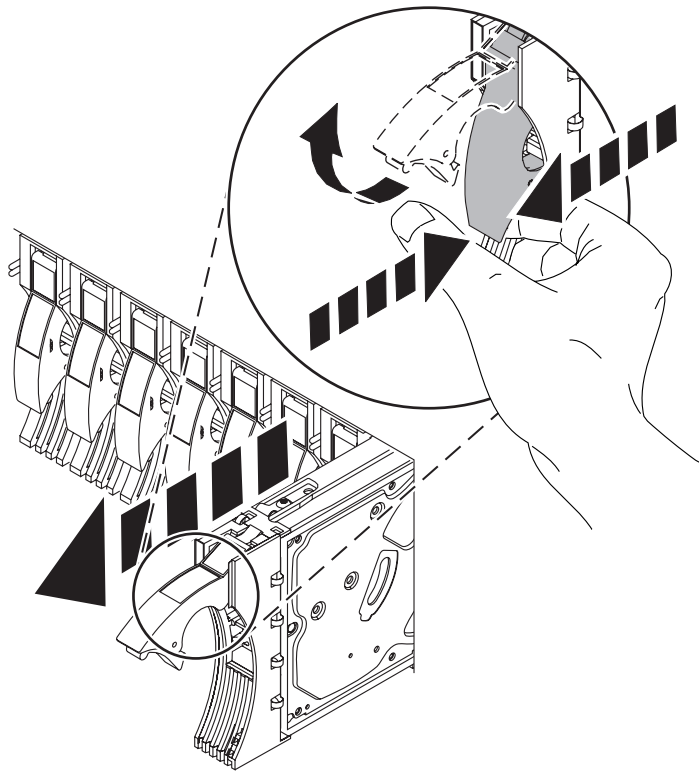
-
9. If you have not yet done so, perform the following steps.
 - a. Slide the disk unit at the location you found in step 4 on page 393 out of the system.

Note: Be very careful with the disk unit—it contains the load-source data.

Remove the Disk Drive by:

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

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



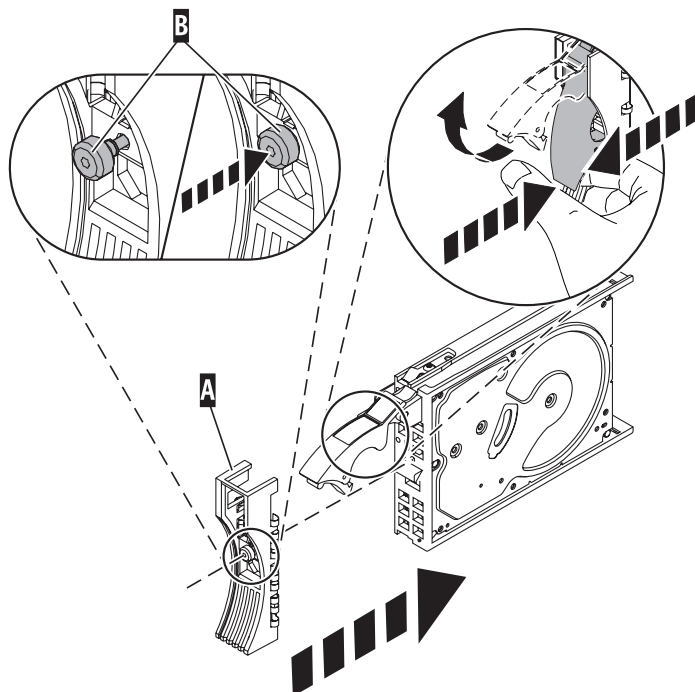
b. Install the new disk unit into the location that used to contain the load-source disk unit.

1) Install the bezel on the new disk drive.

1. Find the package that contains the new disk drive.

Attention: Disk drives are fragile. Handle with care.

2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel **A** to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



2) Install the disk drive.

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
2. Slide the disk drive into the system until it stops.
3. Push the disk drive handle in until it locks.

Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.

10. Install the disk unit that you removed in step 4 on page 393.
11. Were any pages unreadable during the copy operation (see step 7 on page 396)?
 - **No:** The system is ready for the next IPL. **This ends the procedure.**
 - **Yes:** Perform an IPL from removable media and restore the Licensed Internal Code (see *Operations Guide for the Hardware Management Console and Managed Systems*, SA76-0085).

Note: Some objects may be damaged. The customer may have to load the damaged objects again. See *Backup and Recovery*, SC41-5304.

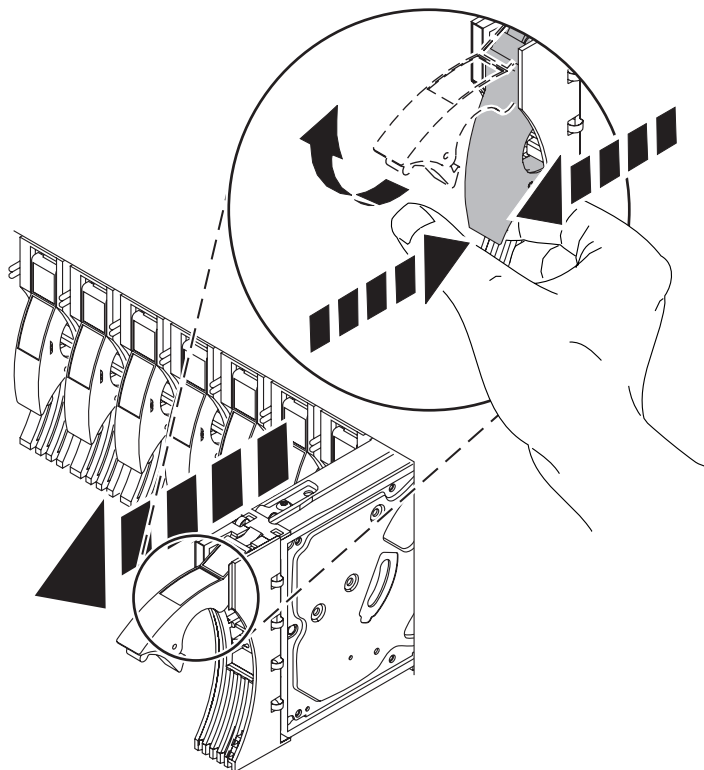
This ends the procedure.

12. Perform the following to remove the failing load-source disk unit on the system:
 - a. Power off the system.
 - b. Find the load-source disk unit.
 - c. Slide the disk unit out of the system.

Remove the Disk Drive by:

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

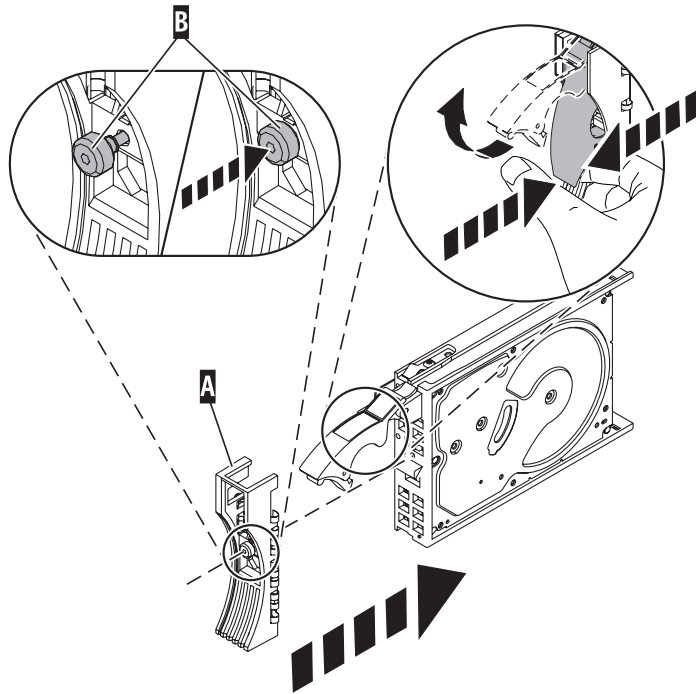
The concurrent maintenance light for the slot turns off when you remove the disk drive.



-
- d. Install the new disk unit.

1) Install the bezel on the new disk drive.

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel **A** to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



2) Install the disk drive.

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
2. Slide the disk drive into the system until it stops.
3. Push the disk drive handle in until it locks.
Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.

13. Perform an IPL from removable media and select the option to install Licensed Internal Code and recover the configuration (see *Operations Guide for the Hardware Management Console and Managed Systems*, SA76-0085).
14. Did you get a Disk Configuration Error Report with a *Unit has incorrect logical partition configuration* warning?
No: Continue with the next step.
Yes: You have logical partitions that need to be recovered. Go to “Restoring profile data” on page 406 and then continue with the next step.
15. The system ASP will be cleared because customer data was not recoverable. Recover the configuration to disk unit 1 in the system unit by performing the following:
 - a. Select **Use Dedicated Service Tools (DST)** from the IPL or Install the System display.
 - b. Enter the password 22222222. If this password is not valid, ask the customer for the correct password.
 - c. From the Use Dedicated Service Tools (DST) display, select **Work with disk units** → **Work with disk unit recovery**.
 - d. Select **Recover configuration option** on the Work With Disk Unit Recovery display. This option assembles the system configuration information on disk unit 1 in the system unit.

Notes:

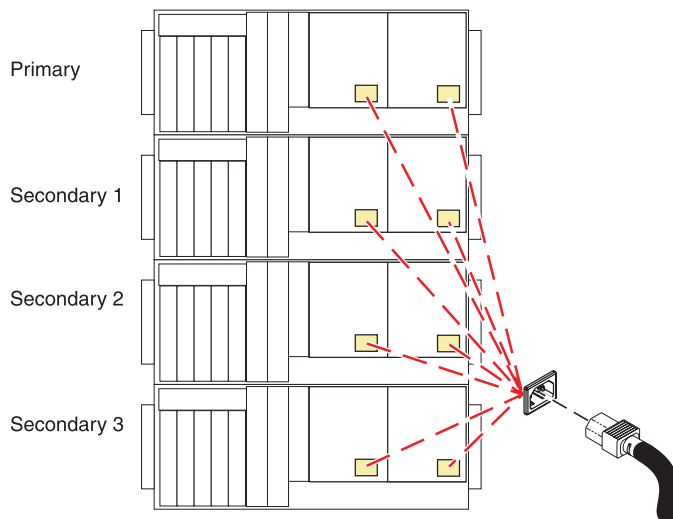
- 1) A warning message will appear stating that recovering the configuration destroys all system data.
 - 2) The recover configuration function cannot be performed on a system with only one disk unit. A message may appear stating that your request to recover the configuration was not successful.
- e. Continue with the next step.
16. The ASP to which the failing disk unit was assigned is cleared. The customer should do the following:
- If the disk unit you exchanged is in ASP 1, refer the customer to *Backup and Recovery*, SC41-5304. You must restore the operating system and all customer data.
 - If the disk unit is in a user ASP (ASP 2 through ASP 16), data in the ASP is lost. See *Backup and Recovery*, SC41-5304. **This ends the procedure.**
17. Is the failing unit missing from the configuration?
- No:** Find another disk unit on the system, other than the load-source disk unit. Continue with the next step.
- Yes:** Go to step 26 on page 406.
18. Perform the following to install a new disk unit on the system:
- a.
- Power off the system and remove the power cords.

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

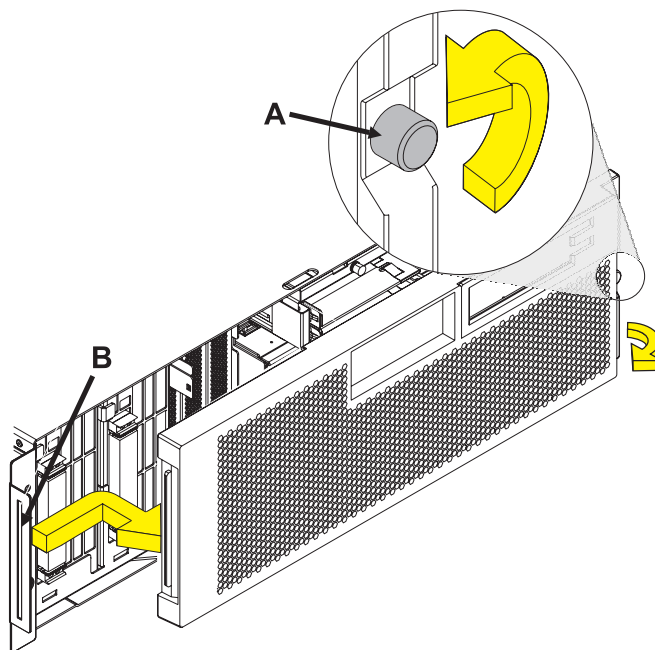
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



b. Access the unit.

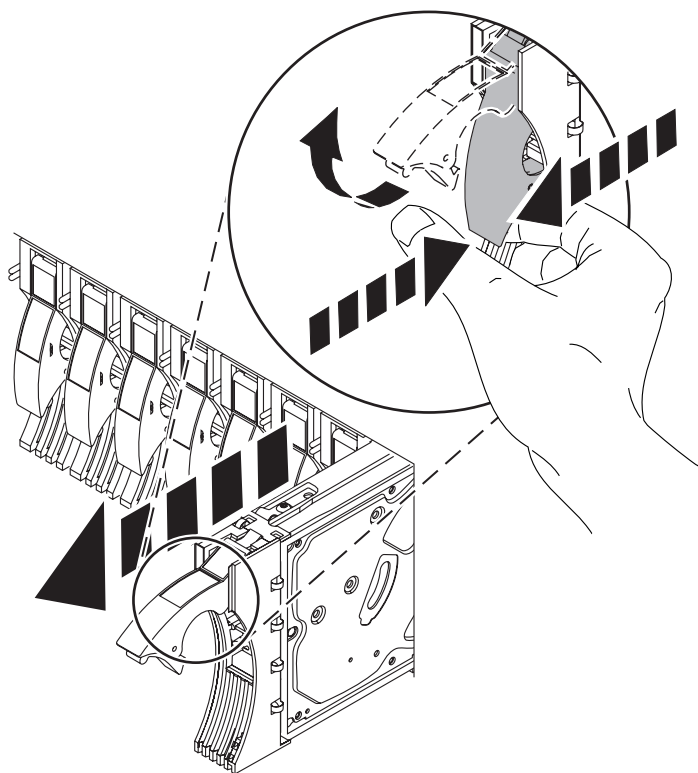
1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



c. Remove the disk drive.

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

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

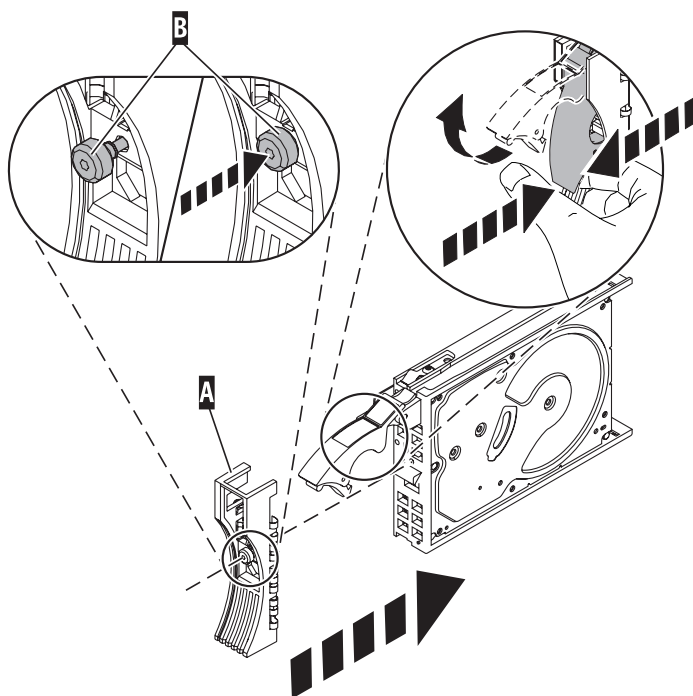


d. Install the bezel on the new disk drive.

1. Find the package that contains the new disk drive.

Attention: Disk drives are fragile. Handle with care.

2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel **A** to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



e. Install the disk drive.

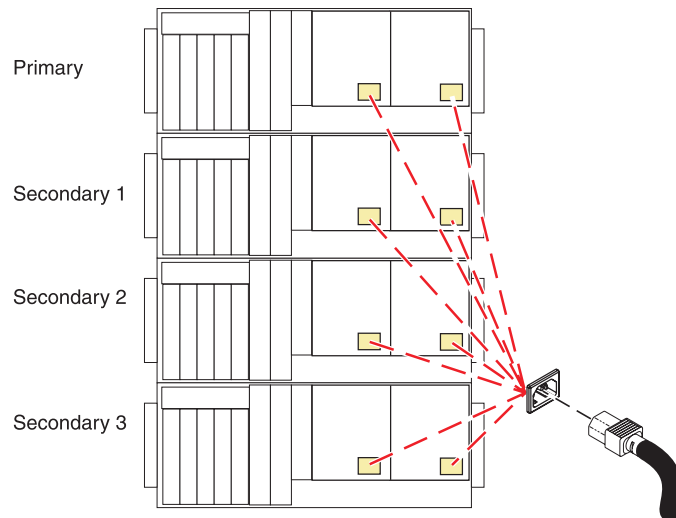
1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
 2. Slide the disk drive into the system until it stops.
 3. Push the disk drive handle in until it locks.
- Note:** It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.
-

- f. Install the power cords.

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



19. Perform an IPL to DST (see “Performing an IPL to DST” on page 695). Does the Use Dedicated Service Tools (DST) display appear?
 - Yes:** Continue with the next step.
 - No:** Repeat step 1 on page 393.
20. Perform the following to format and initialize the disk drive you installed in step 18 on page 402:
 - a. From the Use Dedicated Service Tools (DST) display, select **Work with disk units** → **Work with disk unit recovery** → **Disk unit problem recovery procedures** → **Initialize and format disk unit**.
 - b. Select the unconfigured disk unit that you installed in step 18 on page 402 as the unit to work with.
 - c. Press F10 to verify the initialization and formatting. The initialization and formatting may take 30 minutes or longer to complete.
 - d. Return to the Work with Disk Unit Recovery display.
21. Perform the following to copy data from the failing disk drive to the disk drive you installed in step 18 on page 402:
 - a. Select **Copy disk unit data** on the Work with Disk Unit Recovery display.
 - b. Select the failing unit as the unit to copy.
 - c. Select the unconfigured unit that you installed in step 18 on page 402 as the unit to copy to.
 - d. The console displays the percentage of the data copied. Write down the number of unreadable pages if it displays; you will use it later in this procedure.
 - e. Wait until the status of the copy is *Complete*. Continue with the next step.

Note: Customer data is not recoverable if one of the following occurs:

 - The copy operation does not complete.
 - A large number of unreadable pages must be copied from the disk unit.
22. Perform the following to remove the failing disk unit from the system:
 - a. Power off the system.

- b. Find the failing disk unit. Slide the disk unit out of the system.
23. Perform the following to move the new disk unit into the location that held the failing disk unit:
 - a. Remove the new disk unit from the location you found in step 17 on page 402. Be very careful with the disk unit—it contains sensitive data.
 - b. Install the new disk unit into the location that contained the failing disk unit, which you removed in step 22 on page 405.
24. Install the disk unit you removed in step 18 on page 402.
25. Were any pages unreadable during the copy operation performed in step 21 on page 405?

No: The system is ready for the next IPL. **This ends the procedure.**

Yes: Some objects may be damaged. The customer may have to load the damaged objects again. Refer the customer to *Backup and Recovery*, SC41-5304. **This ends the procedure.**
26. Are there multiple failing disk units under the same IOA?
 - **No:** Continue with the next step.
 - **Yes:** Perform the following:
 - a. Power off the system.
 - b. Exchange the storage IOA (see Chapter 3, “Locating FRUs,” on page 347). If you do not know the part number, see Chapter 8, “Part Information,” on page 741.
 - c. Go to step 1 on page 393.
27. Because the disk data was not recoverable, clear the auxiliary storage pool (ASP) to which the disk unit is assigned by doing the following:
 - a. Return to the Work with Disk Units display and select **Work with disk configuration** → **Work with ASP configuration** → **Delete ASP data**.
 - b. Enter **Delete** for the ASP that you recorded in step 3 on page 393, and confirm the deletion.
 - c. Return to the Work with Disk Units display and select **Work with disk unit recovery** → **Replace configured unit**.
 - d. On the Select Configured Unit to Replace display, select the configured disk unit to exchange.
 - e. On the Select Replacement Unit display, select the replacement disk unit.
 - f. Press **Enter** to confirm the replace operation (this operation takes 10 to 15 minutes to complete). The auxiliary storage pool to which the disk unit is assigned was erased. The customer must restore the data to the auxiliary storage pool. Refer the customer to *Backup and Recovery*, SC41-5304.
28. The ASP to which the failing disk unit was assigned is cleared. The customer should do the following:
 - If the disk unit you exchanged is in ASP 1, refer the customer to *Backup and Recovery*, SC41-5304. You must restore the operating system and all customer data. **This ends the procedure.**
 - If the disk unit is in a user ASP (ASP 2 through ASP 16), data in the ASP is lost. See *Backup and Recovery*, SC41-5304. **This ends the procedure.**

Restoring profile data

Explains how to read the profile data from the previously backed-up file on the HMC and load this data to the managed system.

Selecting this menu item restores profile data to the HMC from a backup file stored on the HMC hard drive.

Note: This is not a concurrent procedure. When the data is restored, the managed system powers on to Partition Standby.

To restore stored profile data on the HMC hard drive, you must be a member of one of the following roles:

- super administrator

- service representative

To restore profile data, do the following:

1. In the Contents area, select the managed system.
2. From the menu, select **Selected > Profile Data > Restore**.
3. Select the profile information that you want to restore from the list of backup files.
4. Select a restore option.
5. Click **OK**.

Rebuild data on a replacement disk drive using Linux

To rebuild data on the replacement disk drive, complete the steps listed here.

For an unprotected disk drive

If the disk drive you are replacing is in a RAID Level 0 disk array or in a failed RAID Level 5 or RAID Level 10 disk array, perform these tasks:

1. Re-create the disk array.
2. Re-create the file systems on the disk array.
3. Copy the data back to the restored disk array from your backup media.

For information on these tasks, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*, SA23-1327.

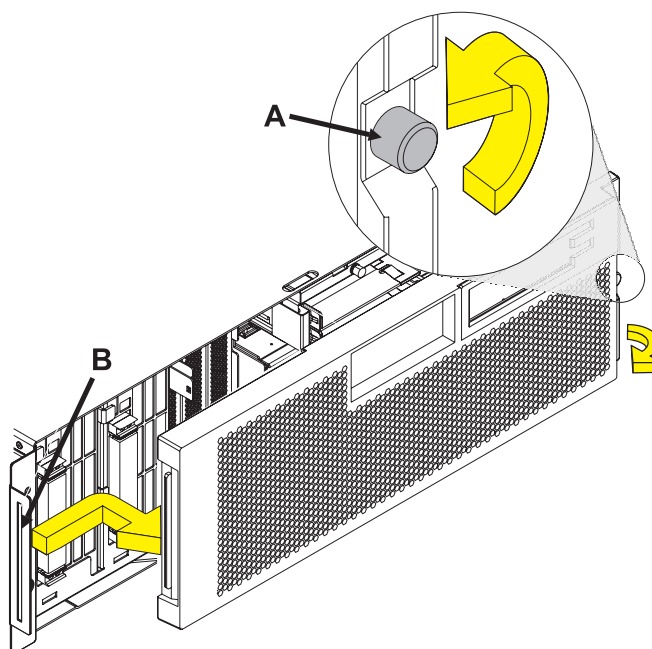
Replace the disk drive using i5/OS

Use this procedure to remove and replace a disk drive Concurrently with i5/OS.

- 1.

Access the unit:

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



2.

To recover any data that might be lost when a disk drive is replaced you must know if the disk drive has data protection.

Do you know the protection status of the disk drive to be removed?

No: Continue with the next step.

Yes: If the disk drive is mirrored, record the status of both disk drives in the mirrored pair and go to step 5 on page 409. If the disk drive is parity protected, go to step 8 on page 409.

3.

Determine the protection status of the disk drive to be removed:

1. Sign on the operator console with at least service level authority.
2. Type strsst on the command line of the i5/OS session and press Enter.
3. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter.
4. Select **Work with disk units** from the System Service Tools (SST) display. Press Enter.
5. Select **Display Disk Configuration** from the Work with Disk Units display. Press Enter.
6. Select **Display Disk Configuration Status** from the Display Disk Configuration display. Press Enter.
A list of each auxiliary storage pool (ASP) displays, showing the disk drives that are members of the ASPs..
7. Is the status of the failing disk drive **Mirrored**?

No: Continue with the next step.

Yes: Record the status of both disk drives in the mirrored pair and continue at step 5 on page 409.

4.

Determine if the failing disk drive is parity protected:

Note: An ASP with a status of Unprotected might contain disk drives that are device parity protected.

Check the status of the failing disk drive for one of the following:

DPY/Active
DPY/Failed
DPY/HDW Failure
DPY/Degraded
DPY/Power Loss
DPY/Not Ready
DPY/Unknown

If the status of the failing disk drive and all other disk drives in the array have a status listed above, the failing disk drive is parity protected.

Is the failing disk drive parity protected?

Yes: Go to step 8 on page 409.

No: The disk drive cannot be replaced concurrently.
Go to "Replace the disk drive nonconcurrently" on page 378.

5.

Does the disk drive you are replacing have a status of Suspended?

Yes: Go to step 8.

No: Check the status of the disk drive that is mirrored to the disk drive you are replacing. If it is Suspended, go to step 7. If it is Active, continue with the next step.

6.

Suspend the disk drive that you are replacing by performing the following:

1. Press **F3** from the Display Disk Configuration display to return to the Work with Disk Units display.
 2. Select Work with Disk Unit Recovery from the Work with Disk Units display and press **Enter**.
 3. Select Suspend mirrored protection from the Work with Disk Unit Recovery display and press **Enter**.
 4. Select the option to suspend the disk drive that you are replacing from the Suspend Mirrored Protection display and press **Enter**.
 5. Go to step 8
-

7.

The suspended mirrored pair of the failing drive has also failed and must be replaced.

Note: Performing a backup is a customer task. Refer to the system's Operations Guide for instructions.

Perform a backup of the data in the failing ASP.

Go to step 8 to replace the failing mirrored disk.

Return to the beginning of this procedure to replace the disk that you originally intended to replace.

8.

Select Device Concurrent Maintenance from the Hardware Service Manager display by:

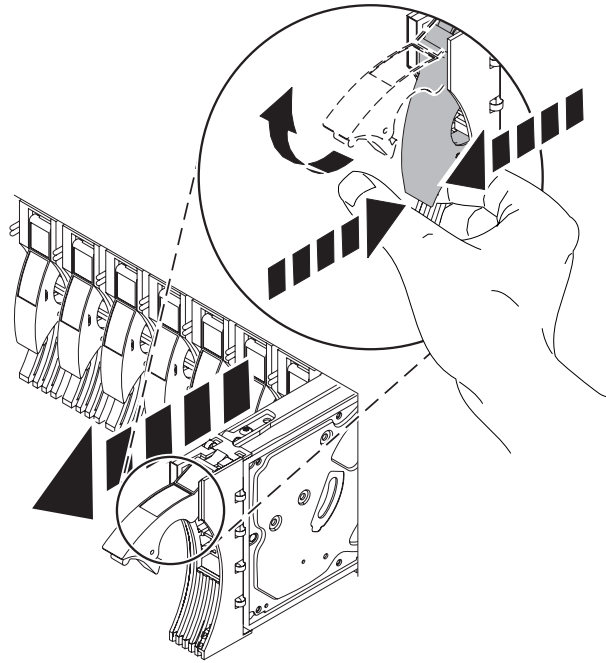
1. Press **F3** until the main SST menus is displayed.
 2. Select option 1 (Start a service tool). Press **Enter**.
 3. Select option 7 (Hardware Service Manager). Press **Enter**.
 4. Select option 8 (Device Concurrent Maintenance). Press **Enter**.
 5. Enter the location code of the disk drive being replaced in the form of: U787A.001.AAAXXXX-P3-D4.
 6. Select option 1 (Remove device) for the **Action to be performed**.
 7. Set the time delay for one minute: 01. **Important:** Do not press Enter at this time.
 8. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing.
 9. **Important:** When you press Enter, after a one minute delay, this light comes on and begins to blink rapidly. You then have nine seconds to remove the disk drive.
 10. Press **Enter** on the console.
 11. When the light blinks rapidly, perform the next step to remove the disk drive within 9 seconds.
-

9.

Remove the disk drive by:

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

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



10.

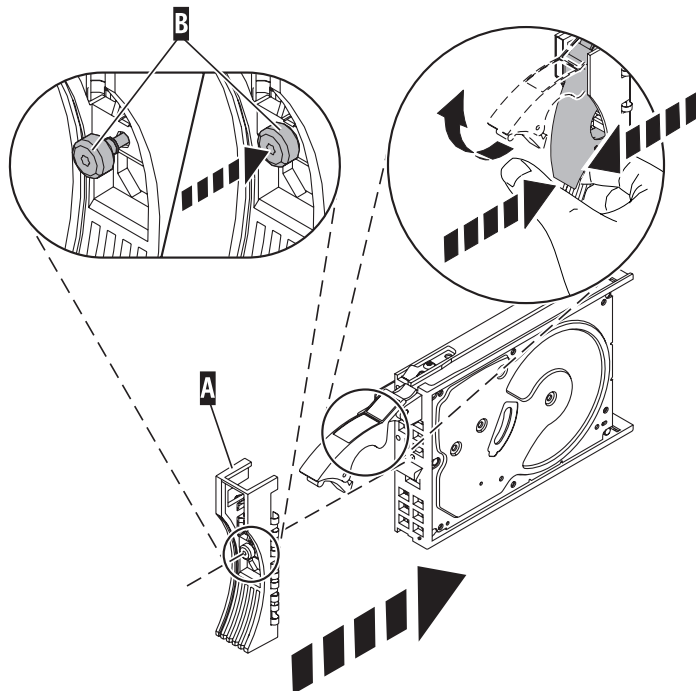
Loosen and pull out on the thumbscrew B to release the disk-drive bezel C from the disk drive, as shown in the graphic.

Continue with the next step.

11.

Install the bezel on the new disk drive:

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel A to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew B to secure the bezel to the disk drive.



12.

1. Return to the console and wait until the Concurrent Maintenance Results display is shown. Press F12.
 2. The physical locations you entered in step 6 of this procedure might still appear on the display. If not, retype the physical location where you will be installing the new disk drive.
 3. Select option **2** (Install device) for the **Action to be performed**.
 4. Set the time delay for one minute: 01. **Important:** Do not press Enter at this time.
 5. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing
 6. **Important:** When you press Enter, after a one minute delay, this light comes on and begins to blink rapidly. You then have nine seconds to install the disk drive.
 7. Continue with the next step.
-

13.

Install the disk drive:

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
 2. Slide the disk drive into the system until it stops.
 3. Press **Enter** on the console.
 4. When the light blinks rapidly, perform the next step to install the disk drive within 9 seconds.
 5. Push the disk drive handle in until it locks.
Note: Ensure that when you install a disk drive that the drive is fully seated and all the way into the system.
 6. Continue with the next step.
-

14.

1. If you removed a front cover, install the front cover
 2. Install or close the system, expansion unit or rack front door.
 3. Return to the console and wait until the Concurrent Maintenance Results display is shown. Press **Enter**.
 4. If you return to the Service Action Log display, exit the service action log.
 5. When the Hardware Service Manager display is shown, press **F3**.
 6. Continue with the next step.
-

15.

Rebuild the data on the replacement disk drive by:

1. If necessary, start System Service Tools (SST) by typing strsst on the command line of the i5/OS® session and pressing Enter.
2. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter. **Note:** The service tools password is case sensitive.
3. Select **Work with disk units** from the Start System Service Tools (SST) display. Press Enter.

Was the failing disk drive mirrored?

Yes: Go to step 19 on page 413.

No: Continue with the next step.

16.

Did the array have a hot spare installed before the failure occurred?

No: Go to step 18 on page 412.

Yes: Continue with the next step.

17.

Perform the following:

1. Select **Non-configured disk units** from the Work with Disk Units display. Press Enter.
 2. Is the new disk unit displayed with a status of non-configured?
Note: It may take several minutes for the new disk drive to be displayed.
No: Contact your next level of support.
Yes: Continue with the next step.
 3. Press **F3** to return to the Work with Disk Units display.
 4. Select **Work with disk unit recovery** from the Work with Disk Units display. Press Enter.
 5. Select **Disk unit problem recovery procedure**. Press Enter.
 6. Select **Initialize and format disk unit**. Press Enter.
 7. Select the new disk and press Enter.
Note: This will take several minutes to complete.
 8. When the disk drive is initialized and formatted, press **F3** to return to the Work with Disk Units display.
 9. Select **Start hot spare**. Press Enter.
 10. Select the IOA with the new disk. Press Enter and press Enter again.
Note: This will take several minutes to complete.
 11. Press F3 (Exit) to return to the System service tools display.
 12. Press F3 (Exit) to return to the Exit SST display and press Enter. **This completes this procedure.**
-

18.

Perform the following:

1. Press **F3** to return to the Work with Disk Units display.
 2. Select **Work with disk unit recovery** from the Work with Disk Units display. Press Enter.
 3. Select **Rebuild disk unit data** on the Work with Disk unit recovery display. Press Enter.
 4. Select 1 to rebuild the disk drive displayed (the disk drive displayed is the disk drive that you removed) on the Rebuild Disk Unit Data display. Press Enter.
 5. Press Enter on the Confirm Rebuild Disk Unit Data display. The rebuild process might take several minutes to complete.
 6. Press F5 to refresh the display until the **Percent complete** shows 5%.
 7. When the display shows at least 5% complete, you can either continue to monitor this display to completion, or press F3 (Exit) to return to the Work with disk units display.
 8. Press F3 (Exit) to return to the System service tools display.
 9. Press F3 (Exit) to return to the Exit SST display and press Enter.
-

19.

1. Select **Work with disk unit recovery** from the Work with Disk Units display. Press Enter.
2. Select **Replace configured unit** on the Work with Disk unit recovery display. Press Enter.
3. Select the configured disk drive that you are exchanging (suspended drive) on the Select Configured Unit to Replace display. Press Enter.
4. Select the disk drive that you just installed on the Select Replacement Unit display. This drive has a nonconfigured status.

Note: In some cases, it might take several minutes for a new disk drive to display. Repeat these steps until the new drive is shown.

Press Enter.

5. Press Enter on the Confirm Replace of Configured Unit display to confirm your choice for replacement.

The replacement process might take several minutes to complete.

When the process is complete, the Work with Disk unit recovery display is shown.

6. Press **F3** (Exit) to return to the Work with disk units display.
7. Select **Display disk configuration** on the Work with disk units display.
8. Select **Display disk configuration status** on the Display Disk Configuration display.

Mirrored status shows Resuming. When complete, the mirrored status shows Active. This process might take several minutes to complete. You can either monitor this display to completion, or press **F3** (Exit) three times, and then press Enter to return to the main menu.

20.

Go to Chapter 5, "Verifying a repair," on page 611. **This completes this procedure.**

Disk unit enclosure

Use this procedure to service a disk unit enclosure.

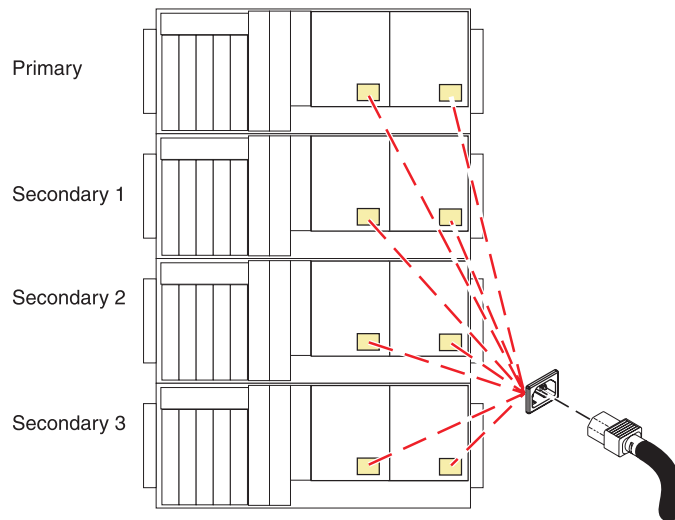
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

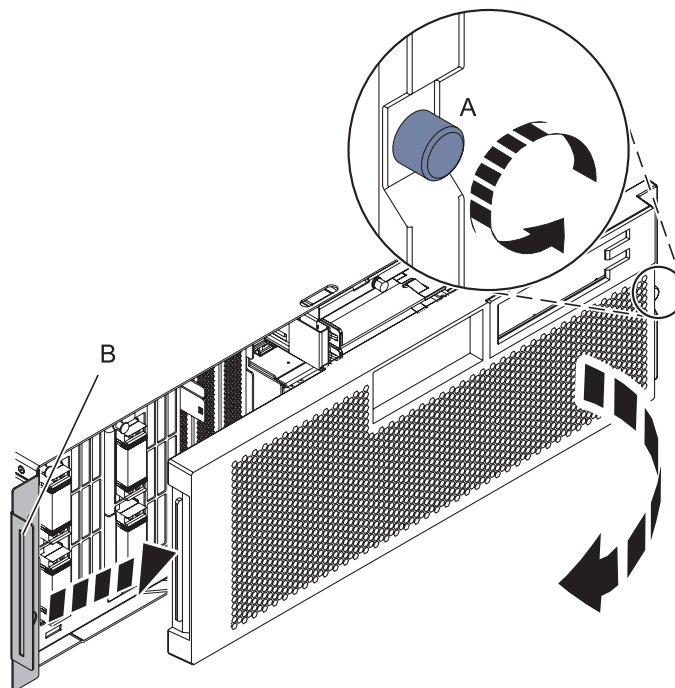
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



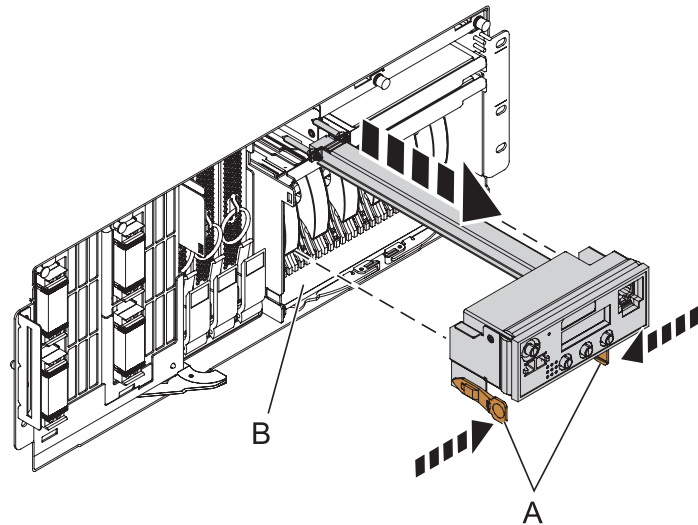
2. Remove the Front Cover

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



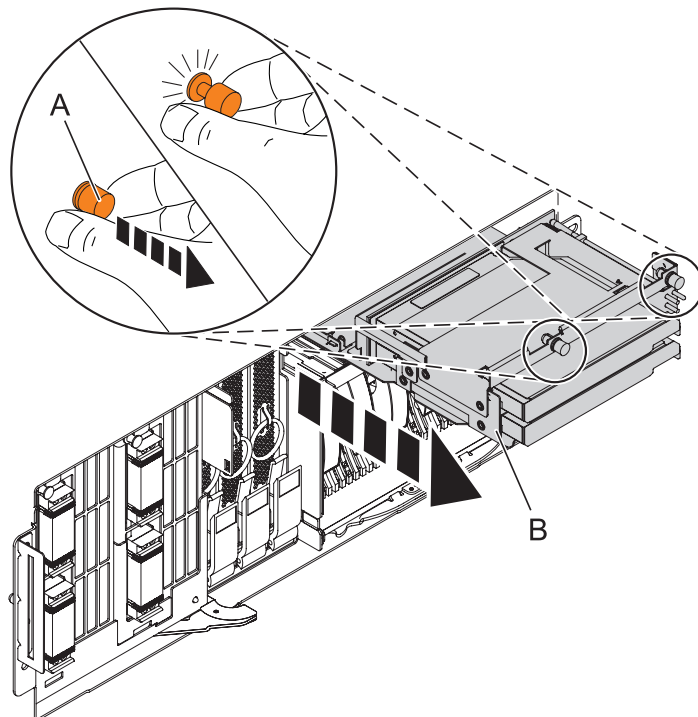
3. Remove the Control Panel or Control Panel Filler

In the enclosure you are servicing, remove the control panel or if present, control panel filler, by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges, and pulling it out of its bay **(B)**.



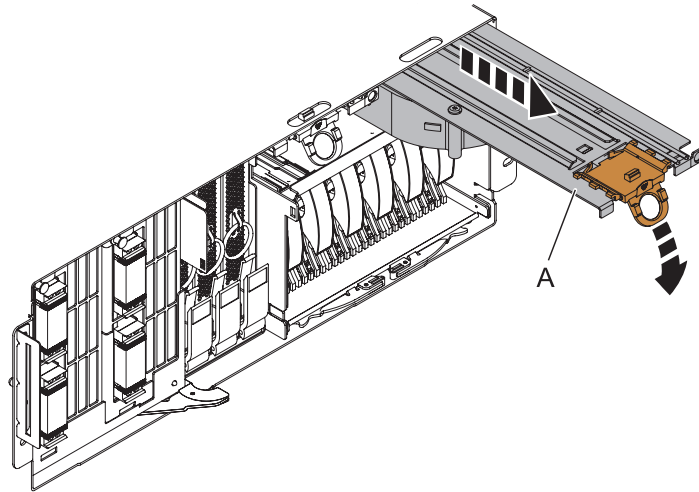
4. Remove the Media Device Enclosure

1. Pull the two terra-cotta locking knobs **(A)** out until they unlock.
2. Pull the enclosure **(B)** out of the system chassis.



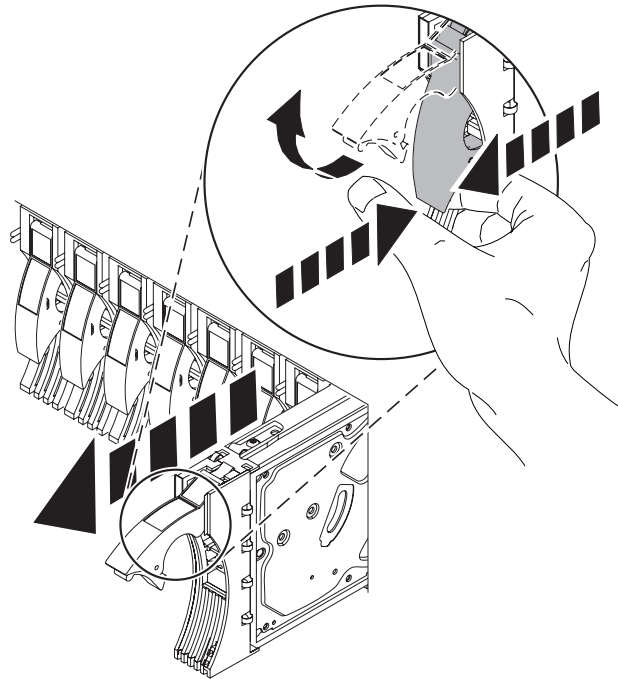
5. Remove the Fans

1. Pull the ring **(A)** downward to disengage it from the system unit.
2. Using the ring, pull the fan straight out of the system unit.
3. Repeat these steps until both fans are removed.



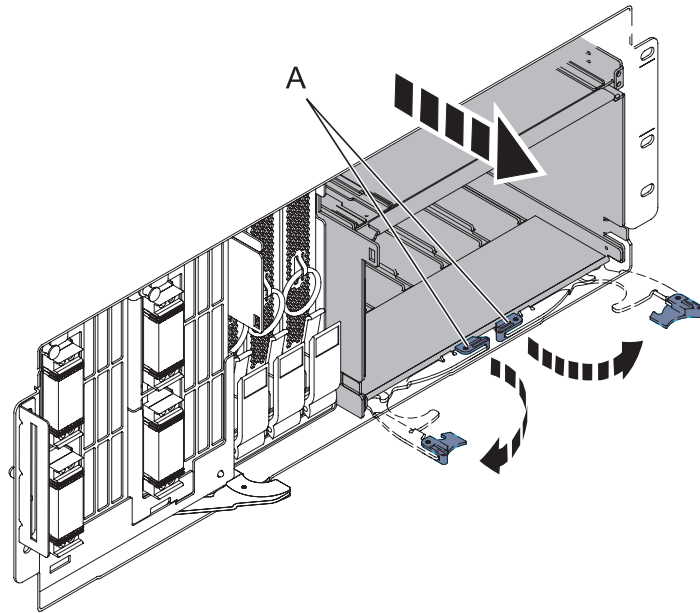
6. Remove all disk units and fillers

1. Label the disk unit you plan to remove.
2. Squeeze the two surfaces of the latching handle together and pull the handle **(A)** towards you to unlock the disk unit from the slot.
3. While supporting the bottom of the disk unit, slide the disk unit straight out of the enclosure. **Note:** Do not hold the disk unit by the handle.
4. Place the disk unit in a location protected from electrostatic discharge.
5. Pull any disk unit fillers forward and out of the system.
6. Repeat these steps until ALL disk units and fillers have been removed.



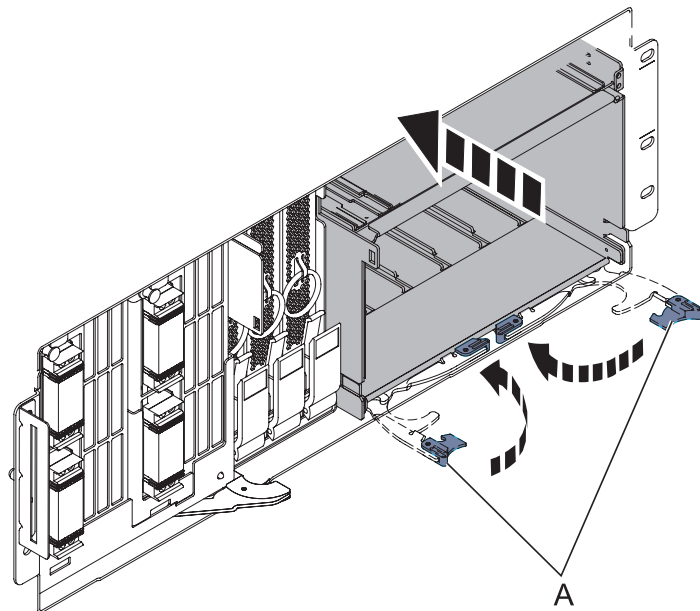
7. Remove the disk unit enclosure

1. Press down and rotate handles **(A)**.
2. Slide the enclosure out of the machine.



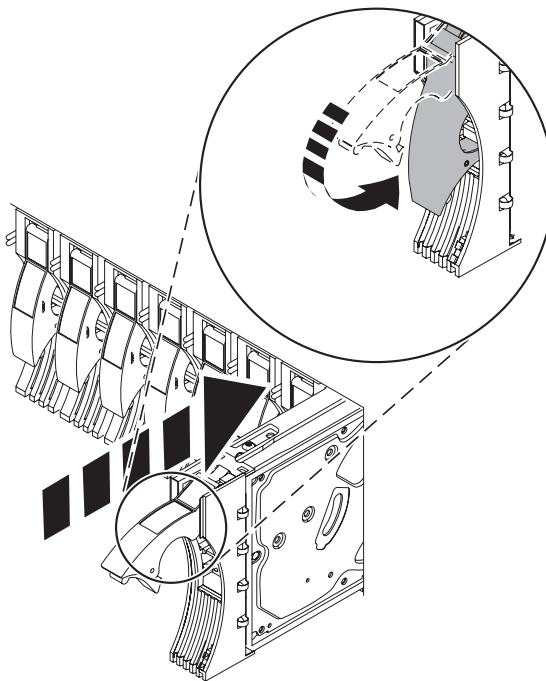
8. Install the new disk unit enclosure

1. Insert the disk unit enclosure into the system unit.
2. Slide the disk unit enclosure into the system until you feel it lock into place.
3. Rotate the handles **(A)** in the direction shown.



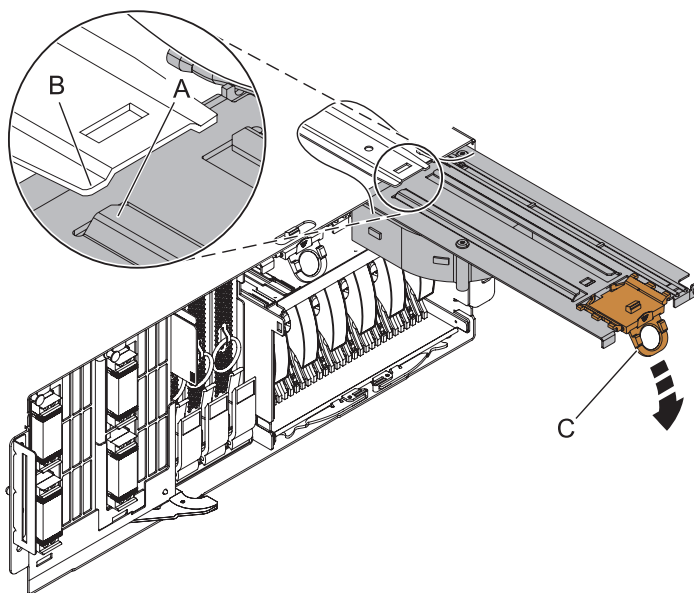
9. Install all disk units and fillers

1. Support the bottom of the disk unit as you align it with the guide rails in the enclosure.
2. Slide the disk unit into the disk unit enclosure until it stops.
3. Push the handle towards the disk unit to lock it into place.
4. Push any disk unit fillers forward and into the system.
5. Repeat these steps until ALL disk units and fillers have been installed.



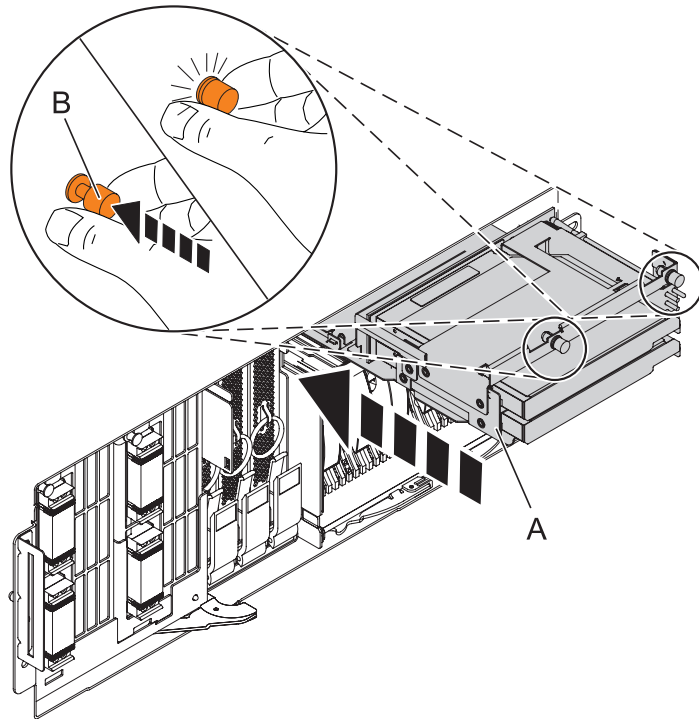
10. Install the Fans

1. Align the fan (**A**) with the guide rails (**B**) inside of the fan slot.
2. Press the fan all the way into the fan slot.
3. Lift up the ring (**C**) to lock the fan into place.
4. Repeat these steps until both fans are installed.



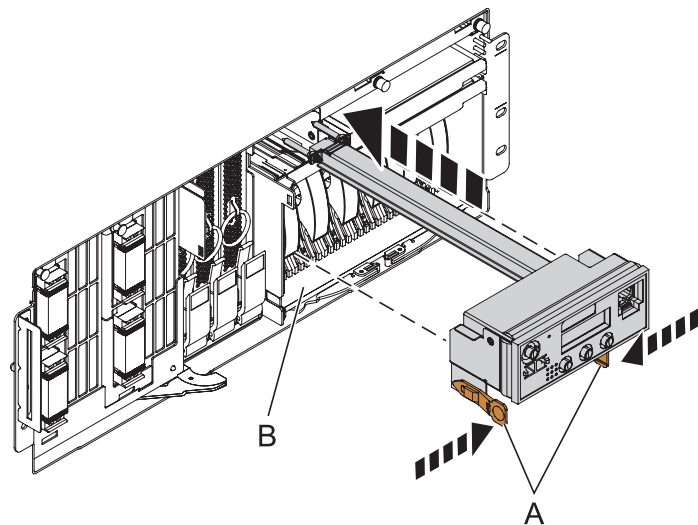
11. Install the Media Device Enclosure

1. Align the media device enclosure with the chassis opening.
2. Push the media device enclosure **(A)** into place, then push the two terra-cotta locking knobs **(B)** into the locked position.



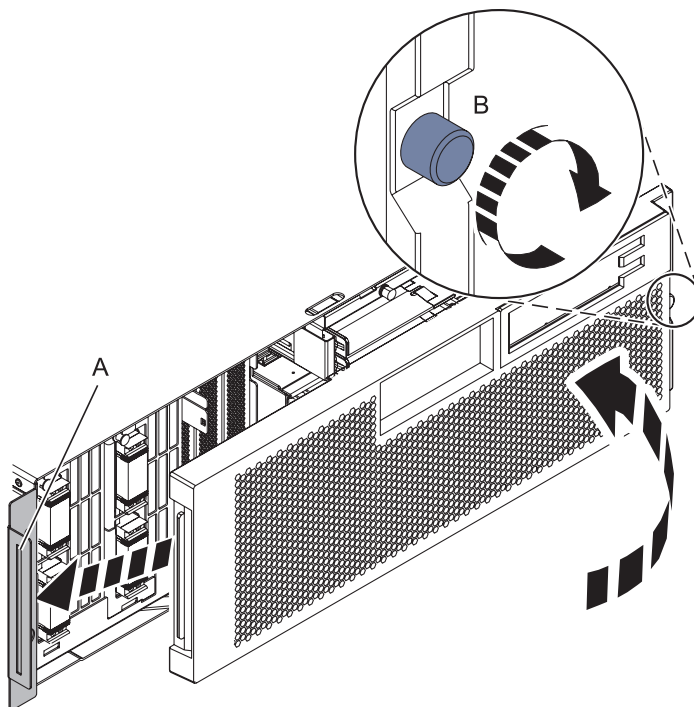
12. Install the Control Panel or Control Panel Filler

In the enclosure you are servicing, carefully slide the control panel or if present, control panel filler, into the control panel bay **(B)** until you feel the locking tabs **(A)** lock in place.



13. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot **(A)** on the left side of the system unit.
2. Tighten the thumbscrew **(B)** on the right side of the cover.
3. Close the front rack door.

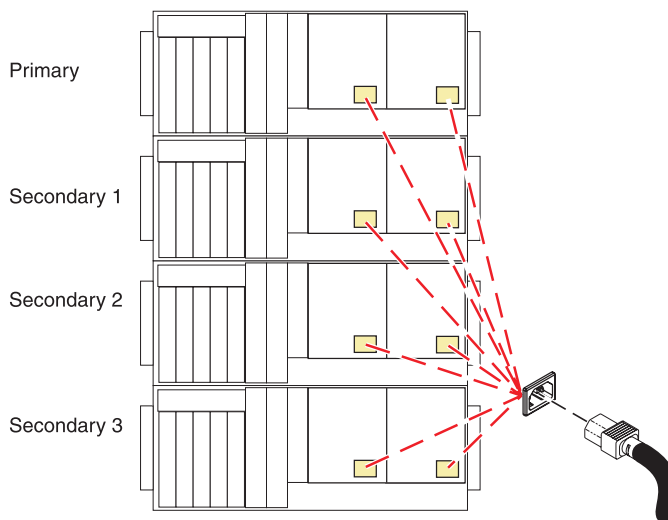


14. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



15. **Verify the repair**

If the power cords were disconnected to perform this procedure, reconnect both power cords in each enclosure now starting with the third enclosure from the top, then the fourth enclosure, then the second enclosure and then the first (topmost) enclosure.

Ensure that the system is powered on.

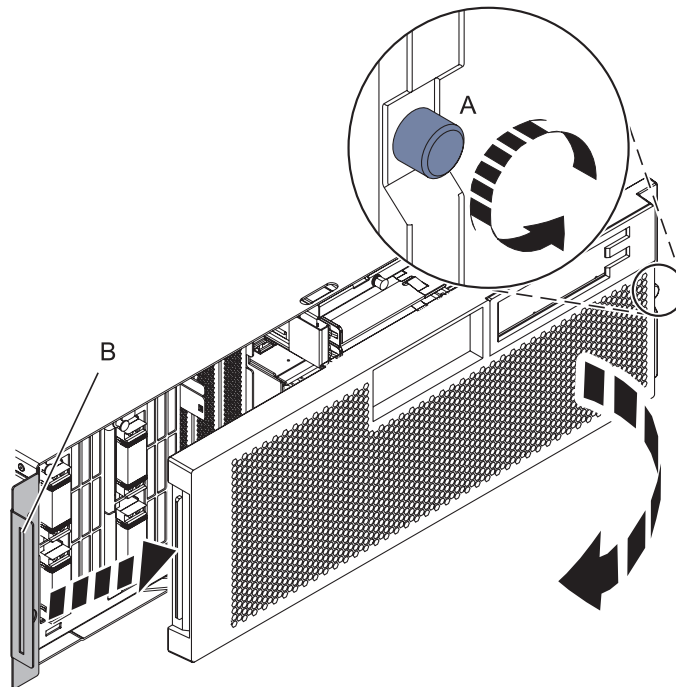
Go to Chapter 5, “Verifying a repair,” on page 611.

Fans

Use this procedure to replace a fan.

1. Remove the Front Cover

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.

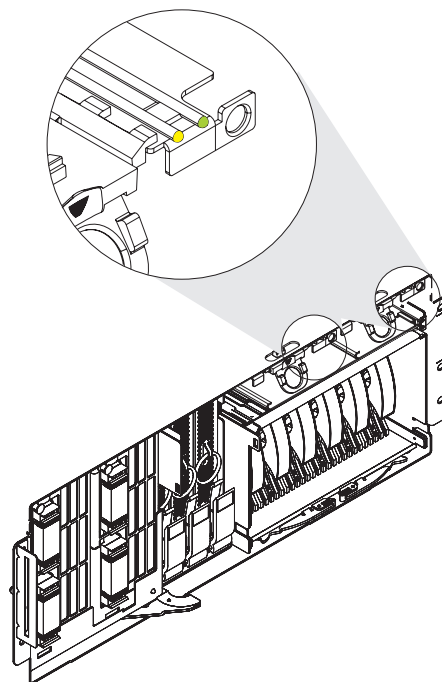


2.

You must determine if the repair can continue concurrently. To continue the repair concurrently, the following conditions must be true:

- A second air moving device (AMD) must already be installed. This AMD unit has a green LED and an amber LED. The green LED must be on, the amber LED may be on or off.

If any of the conditions are not true, the repair can continue only after powering off the unit containing the FRU that is being repaired. If the unit is already powered off, you may proceed with a non-concurrent repair.



3.

Continue the repair concurrently or nonconcurrently.

Do you choose to replace the fan concurrently?

Concurrent repair.	Non concurrent repair.
Continue the repair with unit power on.	Power off the unit and continue the repair.
↓	Go to step 9 on page 424.

4. Use this procedure to service the Fan.

The fan will be serviced concurrently. Power should not be removed from the system during this procedure.

Continue with the next step.

5. Determine if there is a control panel present in the enclosure.

If a control panel is present in the same enclosure as the FRU being serviced, it must be removed.

A control panel is present in the same enclosure as the FRU being serviced:

Yes	No
↓	Go to step 9 on page 424 to remove the control panel filler.

6. Access the ASMI

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power. The ASMI may also be referred to as the service processor menus.

To access the ASMI, refer to "Accessing the ASMI" on page 702.

When you have accessed the ASMI, continue with the next step.

7. Prepare the Control Panel for concurrent replacement

1. In the navigation area of the ASMI, expand "**Concurrent Maintenance**" then select "**Control panel**".
2. At the Preparing the control panel window, select "Remove" and click "Continue".
3. Choose the control panel's location and click "Save Settings".
4. If the operation was successful, the window will display, "Operation completed successfully".

Did the operation complete successfully?

No	Yes
↓	Go to step 9 on page 424

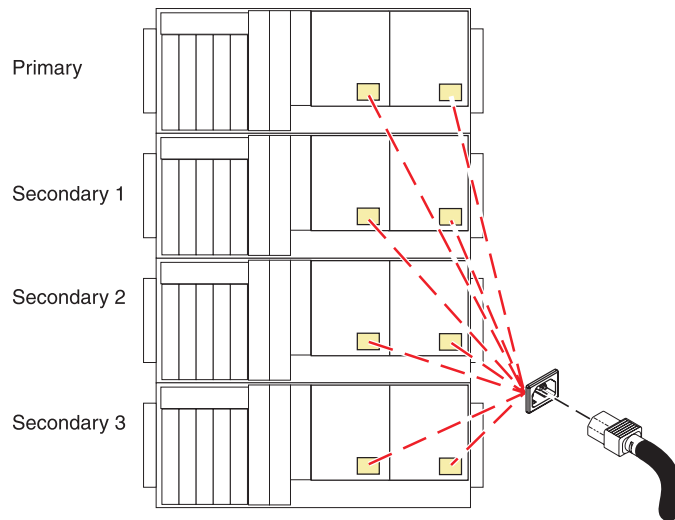
8. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

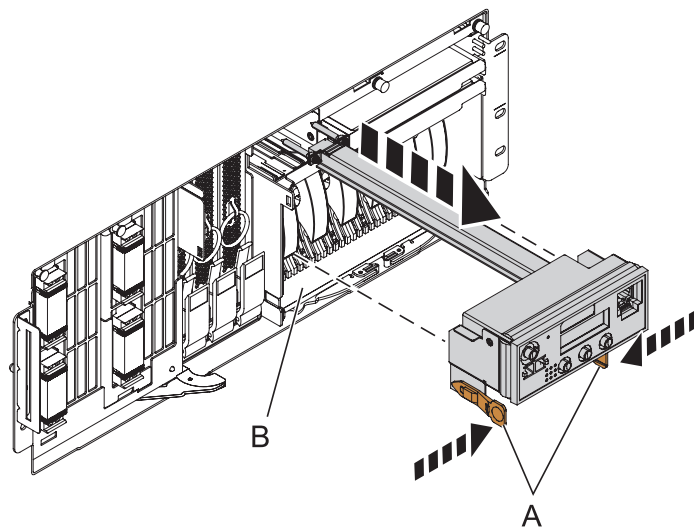
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



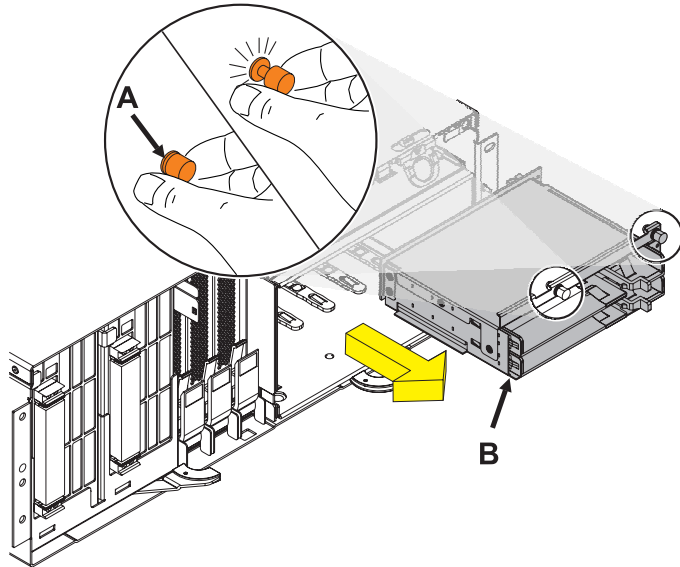
9. Remove the Control Panel or Control Panel Filler

In the enclosure you are servicing, remove the control panel or if present, control panel filler, by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges, and pulling it out of its bay **(B)**.



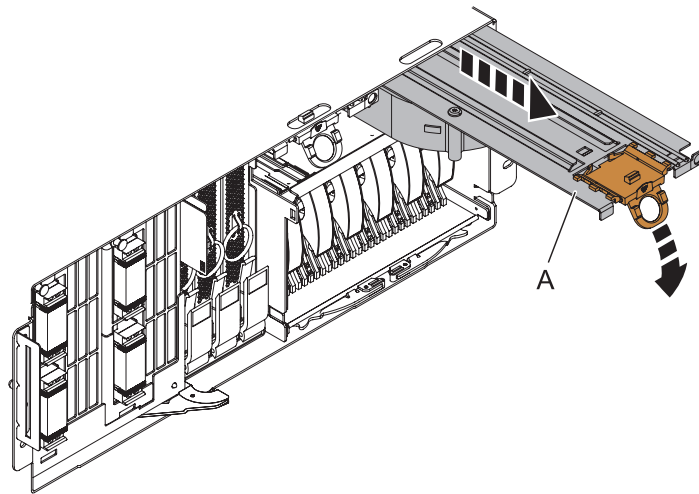
10. Remove the Media Device Enclosure

1. Pull the two terra-cotta locking knobs **(A)** out until they unlock.
2. Pull the enclosure **(B)** out of the system chassis.



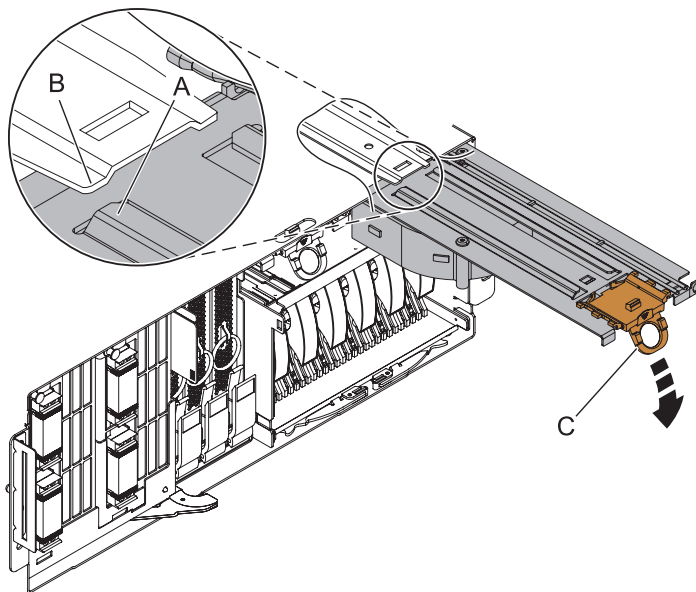
11. Remove the Fan

1. Pull the ring **(A)** downward to disengage it from the system unit.
2. Using the ring, pull the fan straight out of the system unit.



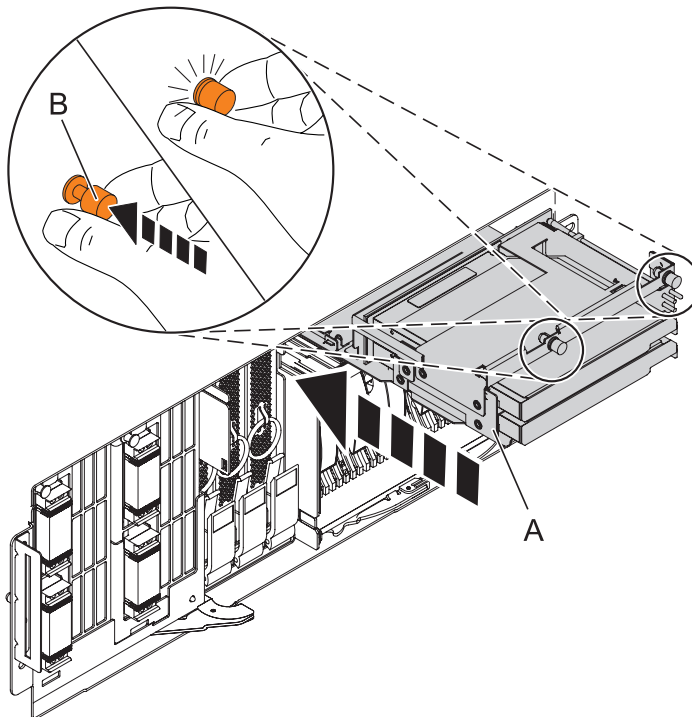
12. Install the new Fan

1. Align the fan **(A)** with the guide rails **(B)** inside of the fan slot.
2. Press the fan all the way into the fan slot.
3. Lift up the ring **(C)** to lock the fan into place.



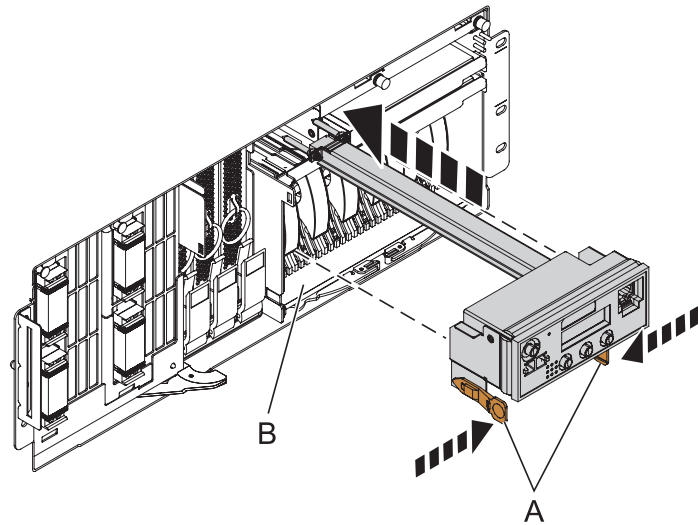
13. Install the Media Device Enclosure

1. Align the media device enclosure with the chassis opening.
2. Push the media device enclosure **(A)** into place, then push the two terra-cotta locking knobs **(B)** into the locked position.



14. Install the Control Panel or Control Panel Filler

In the enclosure you are servicing, carefully slide the control panel or if present, control panel filler, into the control panel bay (B) until you feel the locking tabs (A) lock in place.



15.

Are you performing a concurrent repair?

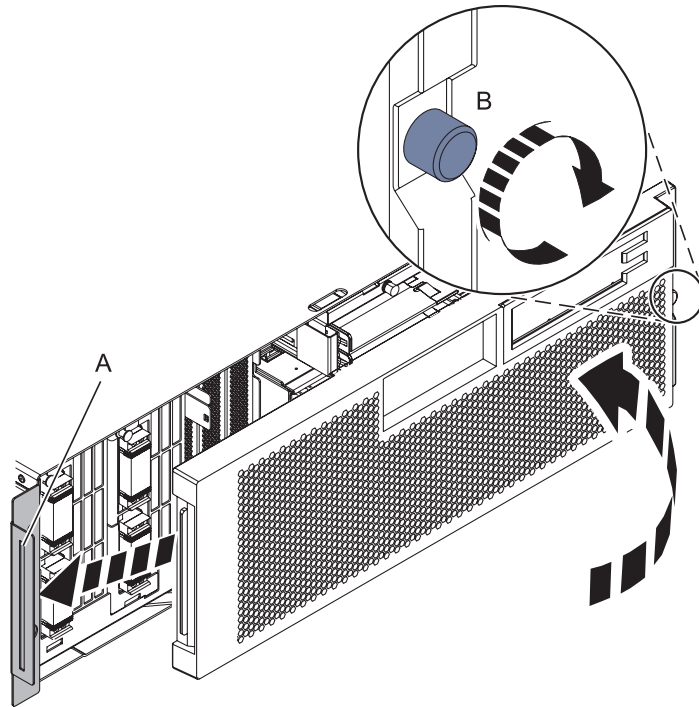
Yes	Non-concurrent repair.
↓	Go to step 17 on page 428.

16. Install the Control Panel

1. In the navigation area of the ASMI, expand "**Concurrent Maintenance**" then select "**Control panel**".
 2. At the Preparing the control panel window, select "Install" and click "Continue".
 3. Choose the control panel's location and click "Save Settings".
 4. If the operation was successful, the Operation completed successfully window will display.
-

17. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot **(A)** on the left side of the system unit.
2. Tighten the thumbscrew **(B)** on the right side of the cover.
3. Close the front rack door.



18.

Are you doing a concurrent repair?

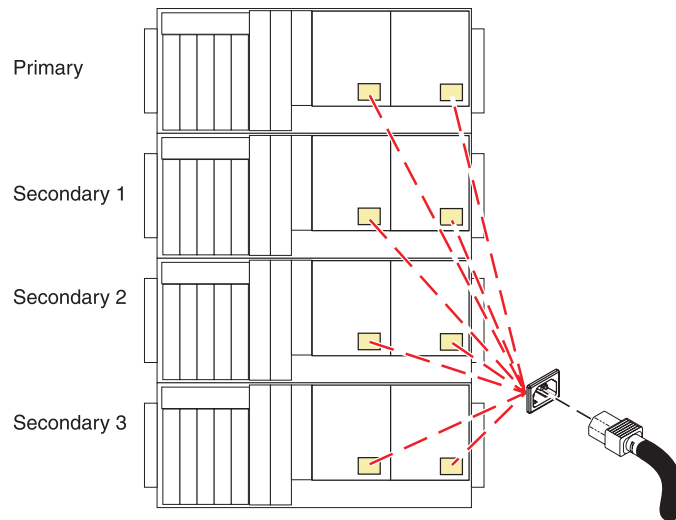
No	Yes
↓	Go to step 20 on page 429.

19. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



20. Verify the repair

Go to Chapter 5, “Verifying a repair,” on page 611.

I/O Backplane

Use this procedure to service the I/O backplane.

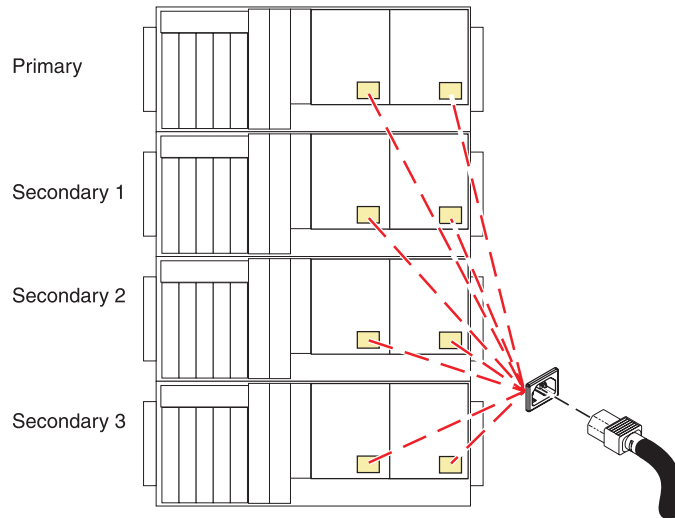
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

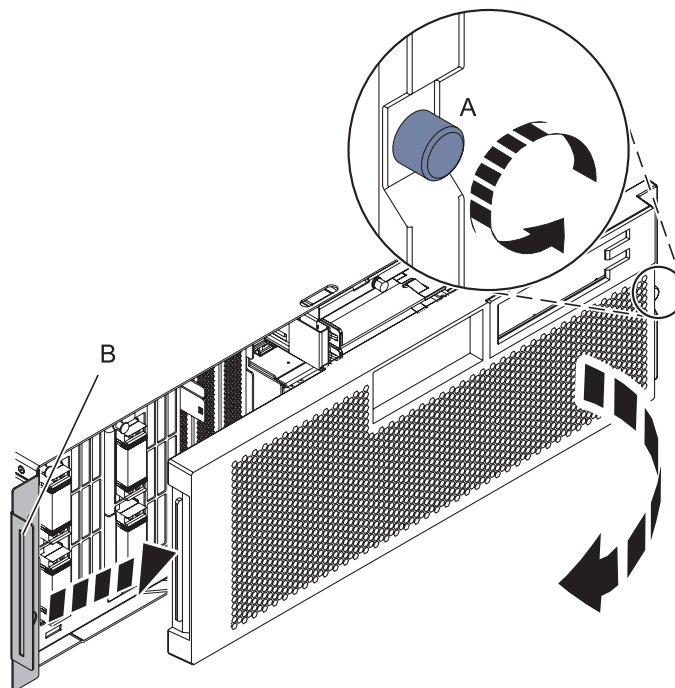
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



2. Remove the Front Cover

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.

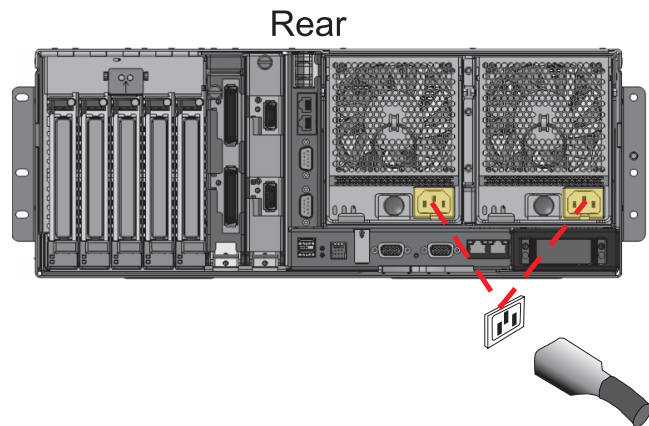


3. Open the back rack door

Open the back rack door.

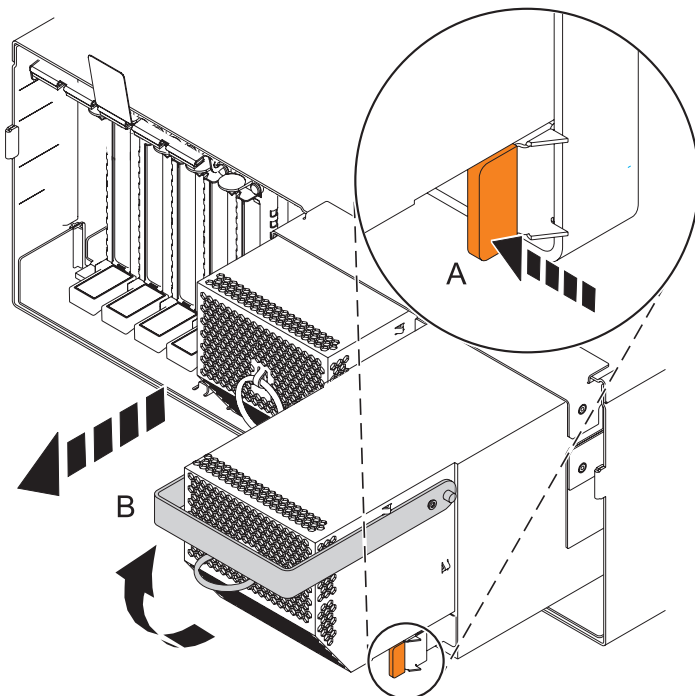
4. Disconnect both power cords

Disconnect BOTH power cords from the enclosure.



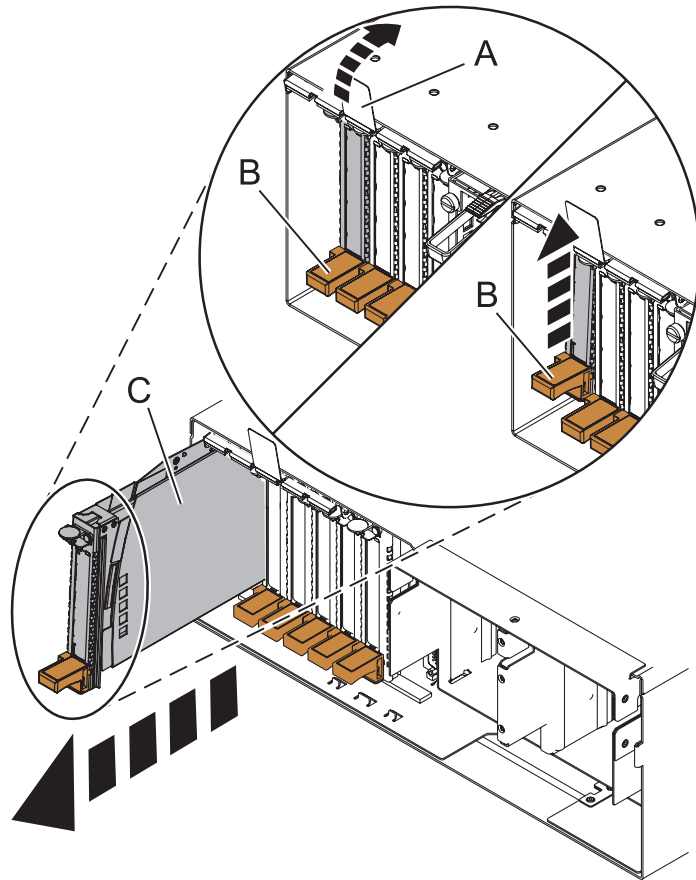
5. Remove both power supplies

1. Push the handle latch (A) to release the handle.
2. Lift the handle (B) up and into the open position.
3. Using the handle, pull the power supply out of the power supply bay. **CAUTION: This part or unit is heavy, but has a weight smaller than 18 kilograms (39.7 pounds). Use care when lifting, removing, or installing this part or unit. (C008)**
4. Repeat these steps until both power supplies are removed.



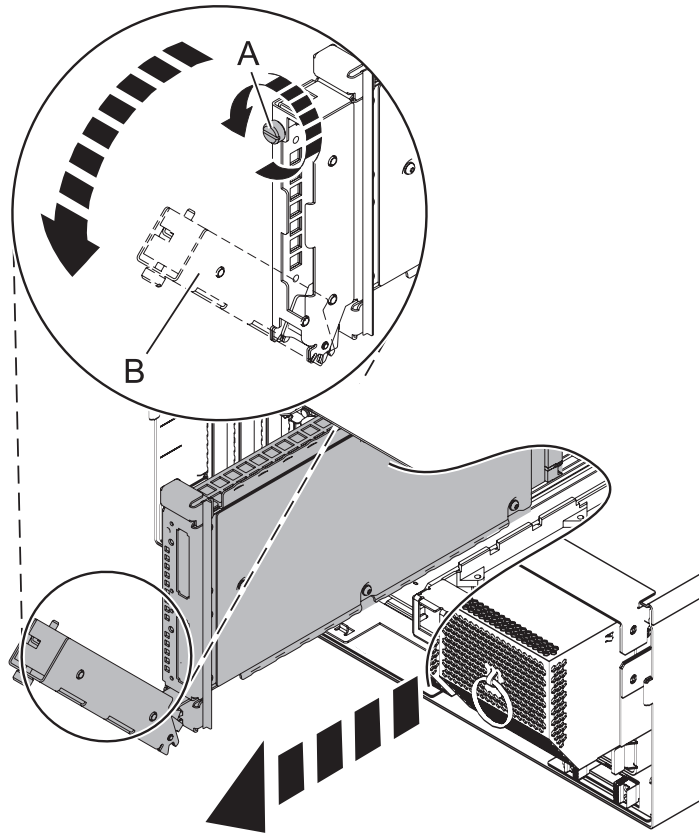
6. Remove all PCI cards

1. Label and remove all PCI cables from the rear of the system.
2. Lift and hold the PCI adapter EMC shield **(A)** in the open position.
3. Lift the lower cassette handle up **(B)** as shown.
4. Pull the PCI cassette **(C)** out of the system unit.
5. Lower the PCI adapter EMC shield into the closed position.
6. Repeat these steps until all PCI Adapter Cards or PCI Adapter Fillers in slots C1 through C5 have been removed.



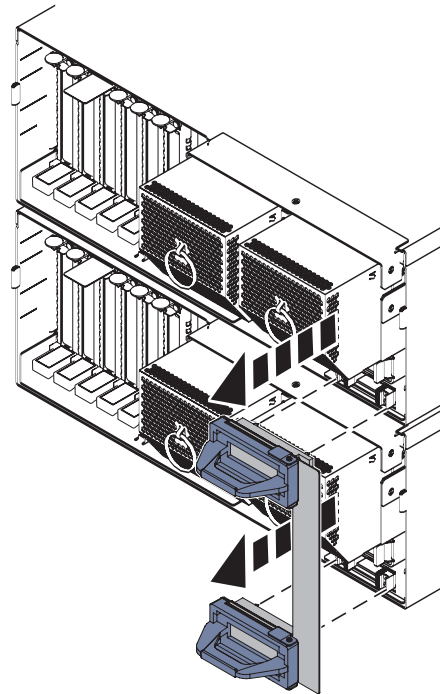
7. Remove the HSL/RIO Adapter Card

1. Label and Remove all HSL/RIO cables from the rear of the system.
2. Rotate the thumbscrew **(A)** counterclockwise to unfasten the card.
3. Pull the handle **(B)** down.
4. Pull the card from its slot.
5. Repeat these steps to remove a second NIC Card (if present).



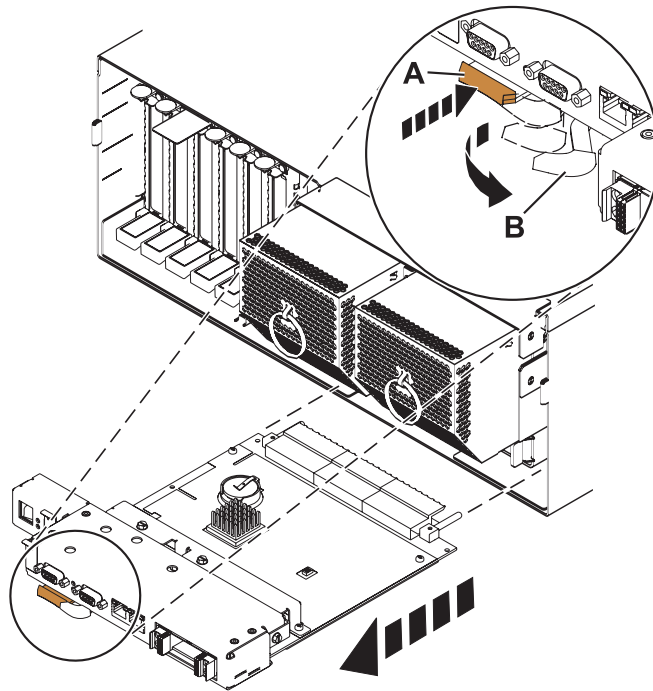
8. Remove the Service Processor Cable if installed

1. Grasp the service processor cable handle on one system unit and pull it from the system unit.
2. Repeat the process for the other system unit.



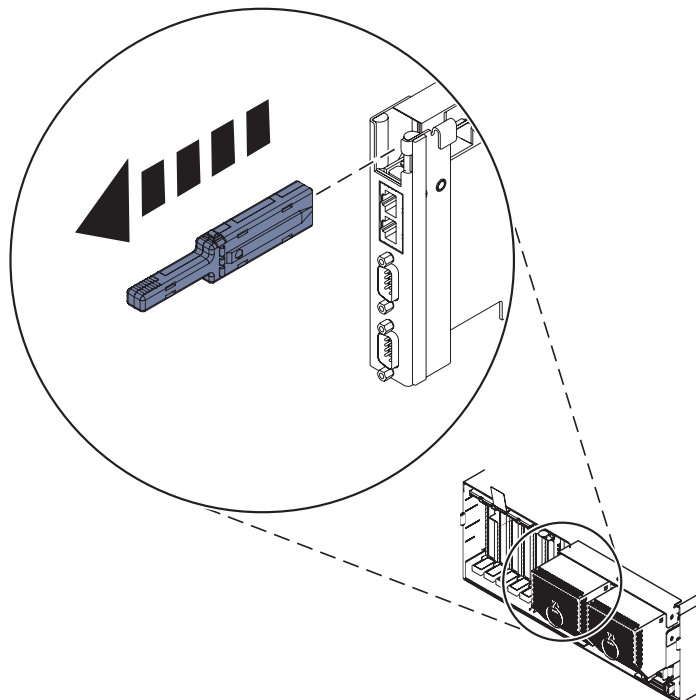
9. Remove the Service Processor Assembly

1. Label and disconnect all cables connected to the service processor assembly.
2. Press the thumb release **(A)** on the service processor assembly to unlock the handle.
3. Pull the handle to the right to unseat the service processor assembly.
4. Pull the service processor assembly from the card enclosure using the handle and supporting the bottom of the card.



10. Remove the VPD Card

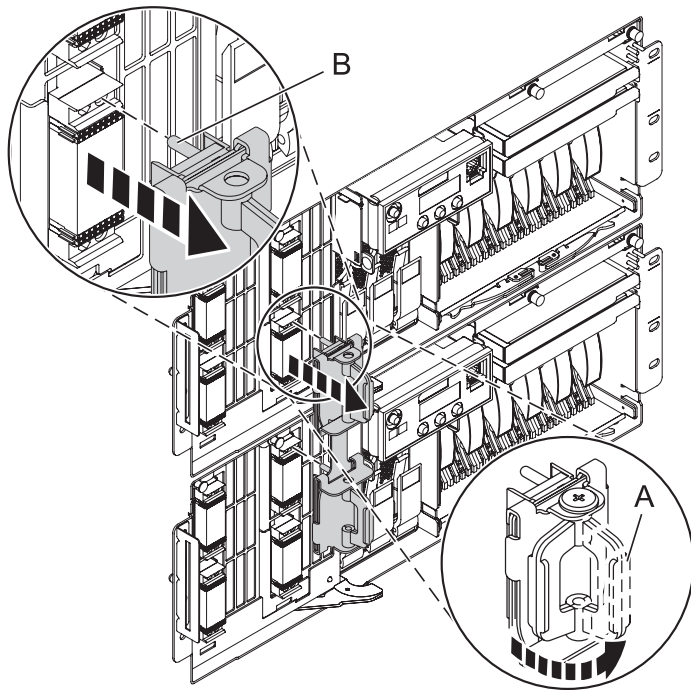
Pull the VPD card free by the blue handle and remove from the system.



11. Disconnect the SMP Cable if installed

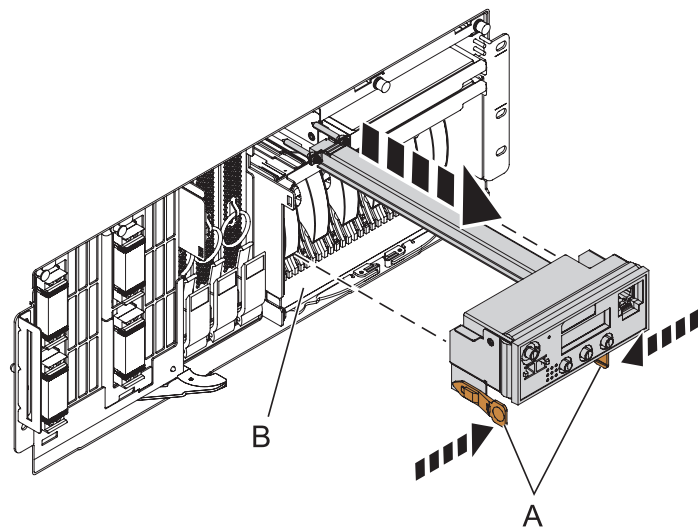
1. Carefully pull the handle **(A)** from the system until the connector is unseated.
2. When the guide pins **(B)** are free, carefully pull the SMP processor cable away from the system unit.

Repeat these steps for all SMP cable connectors that are present on the system you are servicing.



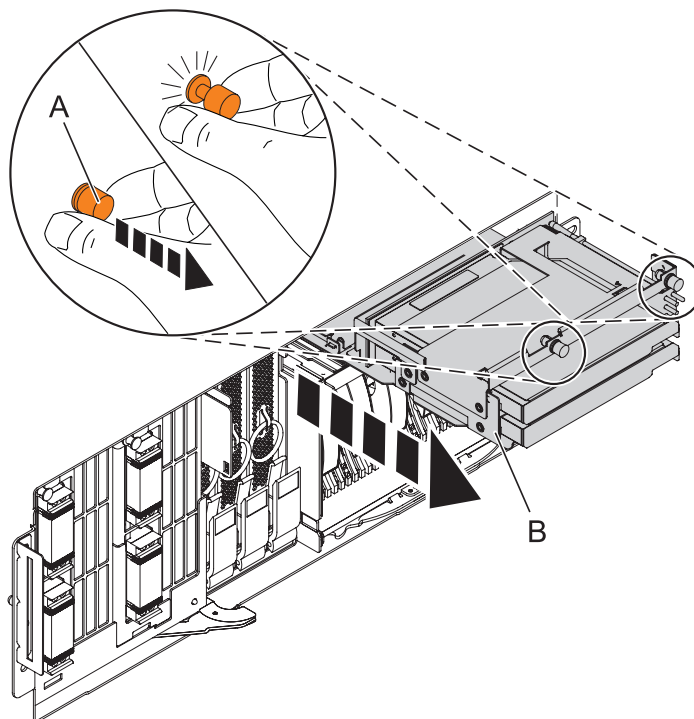
12. Remove the Control Panel or Control Panel Filler

In the enclosure you are servicing, remove the control panel or if present, control panel filler, by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges, and pulling it out of its bay **(B)**.



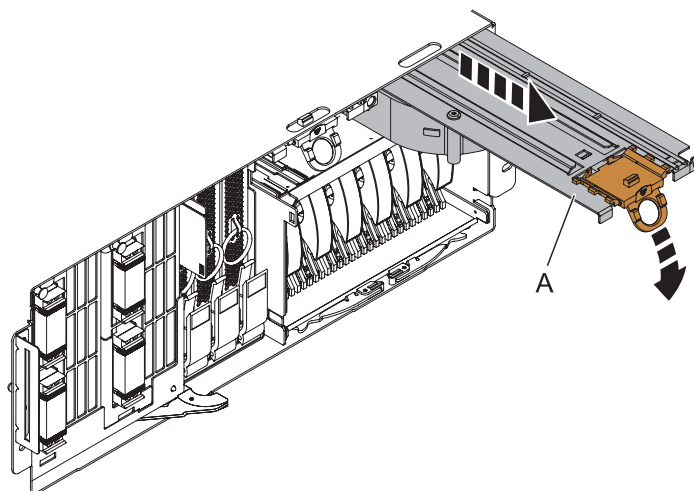
13. Remove the Media Device Enclosure

1. Pull the two terra-cotta locking knobs (**A**) out until they unlock.
2. Pull the enclosure (**B**) out of the system chassis.



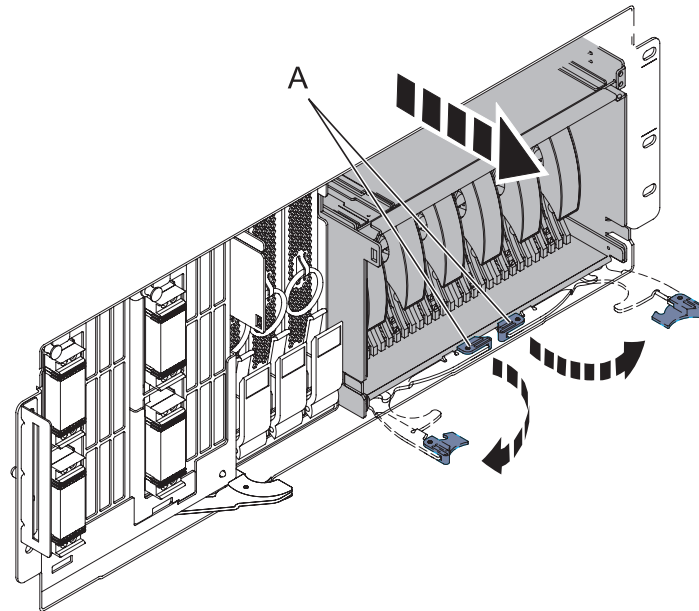
14. Remove the Fans

1. Pull the ring (**A**) downward to disengage it from the system unit.
2. Using the ring, pull the fan straight out of the system unit.
3. Repeat these steps until both fans are removed.



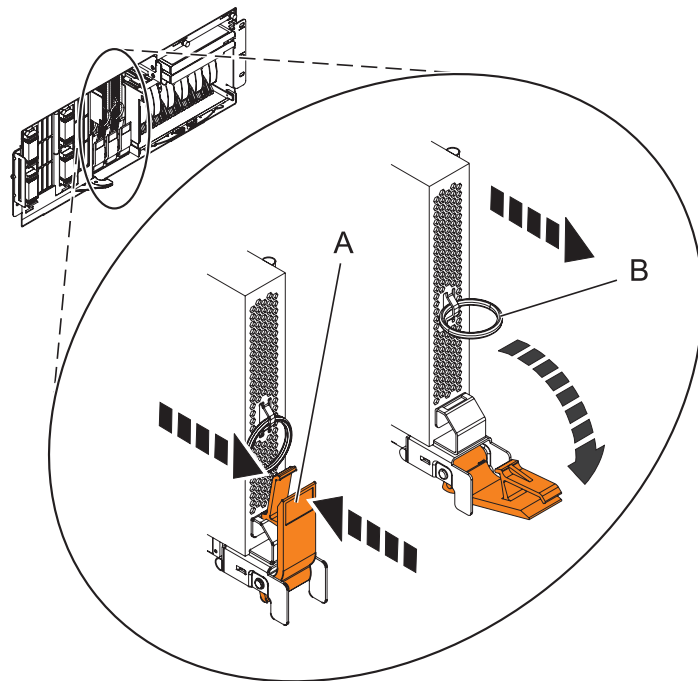
15. Remove the disk unit enclosure

1. Press down and rotate handles **(A)**.
2. Slide the enclosure out of the machine.



16. Remove the Voltage Regulator Assemblies

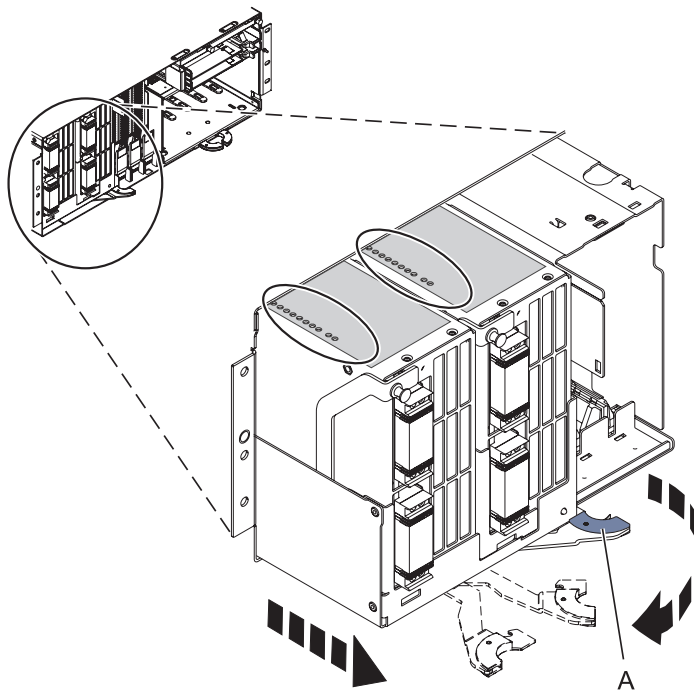
1. Squeeze the top of the latch **(A)** to release it, then rotate the latch out and then down.
2. Grasp the pull ring **(B)** and slowly pull the voltage regulator out of the enclosure.
NOTE: Pulling the voltage regulator assembly out of the card enclosure requires a large amount of force. The voltage regulator assembly is of substantial weight, so grasp it firmly when it is free of the card enclosure.
3. Repeat these steps until all voltage regulator assemblies have been removed.



17. Remove the System Backplane Assembly

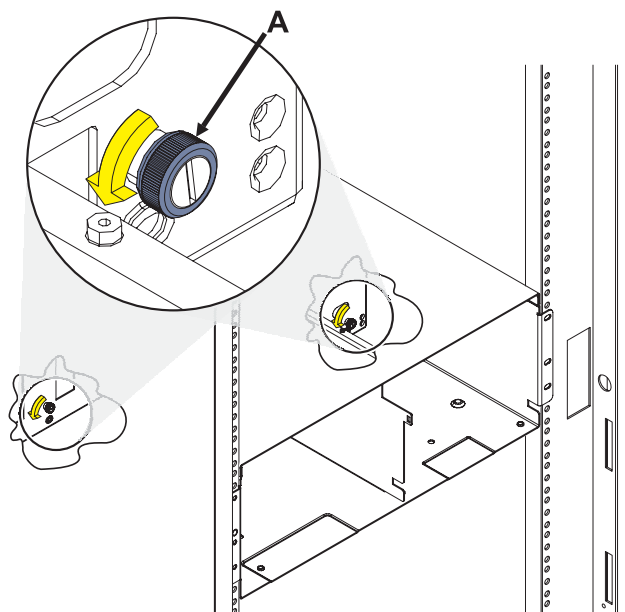
1. Push the blue lever to the left and out from the system (**A**) to unlock the system backplane assembly.
2. Pull the system backplane assembly out of the system using both hands.

ATTENTION: The system backplane assembly weighs 35 lbs and should not be pulled out using the blue lever. Grasp the backplane assembly firmly with both hands when it is free of the system.



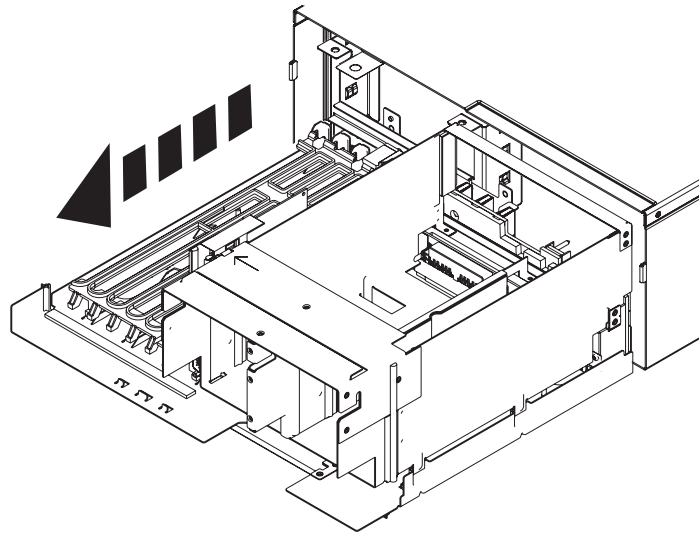
18. Loosen the thumbscrews

Loosen the two thumbscrews (**A**) at the front of the backplane.



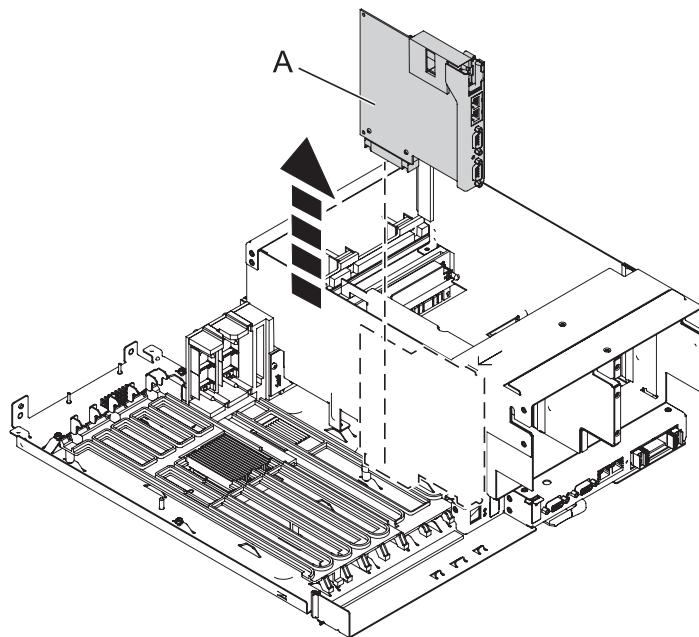
19. Remove the IO backplane from the rear of the system

1. Slide the IO backplane from the enclosure and set it aside.



20. Remove the VPD Passthrough Card

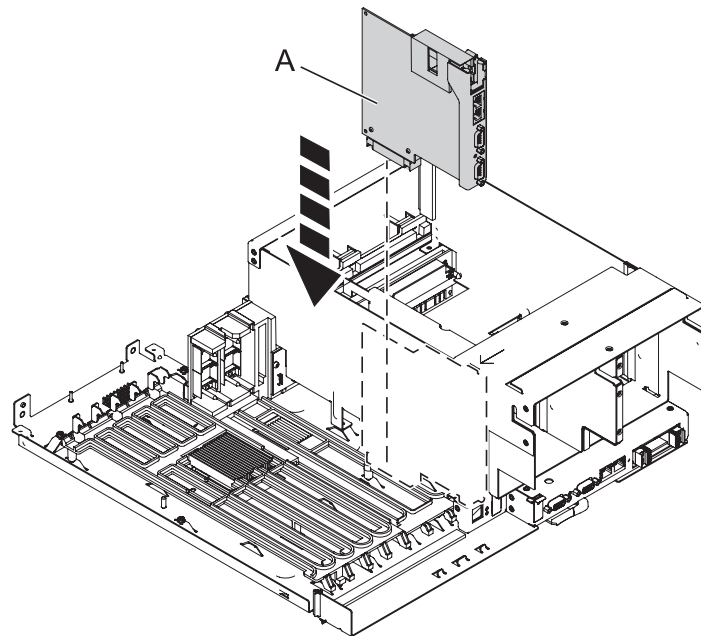
Remove the passthrough card from the I/O backplane assembly by pulling it straight up and out of the I/O backplane assembly.



21. Install the VPD Passthrough Card on the New I/O Backplane

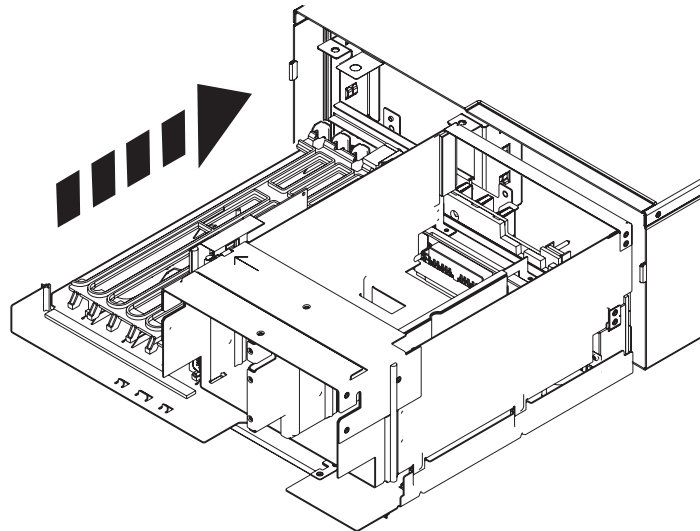
1. Note the metal tab on the top edge of the passthrough card.
2. Insert the card into the connector on the I/O backplane ensuring that the metal tab engages the slot on the top edge of the shroud for the power supplies.

ATTENTION: If the tab does not engage the slot in the shroud, the passthrough card will not connect securely and damage to the pins on the connector could occur.



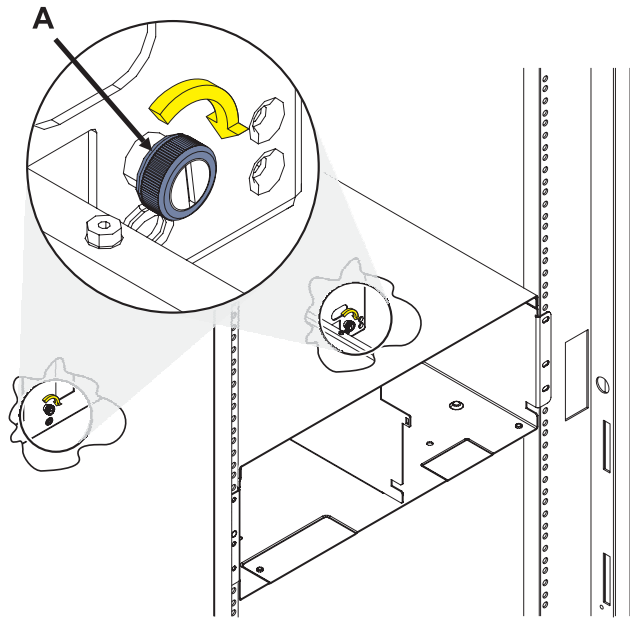
22. Install the new I/O Backplane

1. Carefully slide the IO backplane into the enclosure.



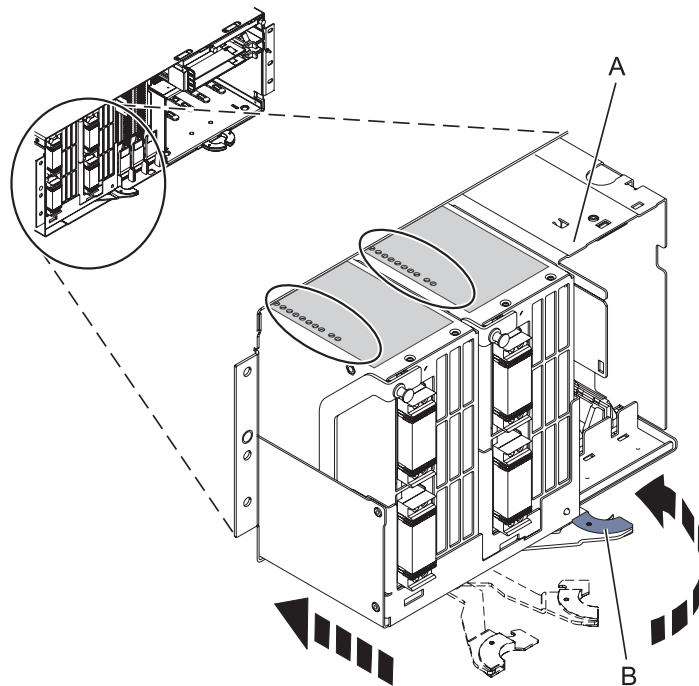
23. Tighten the thumbscrews

1. Tighten the two thumbscrews **(A)** at the front of the backplane.
2. Ensure the backplane is seated properly.



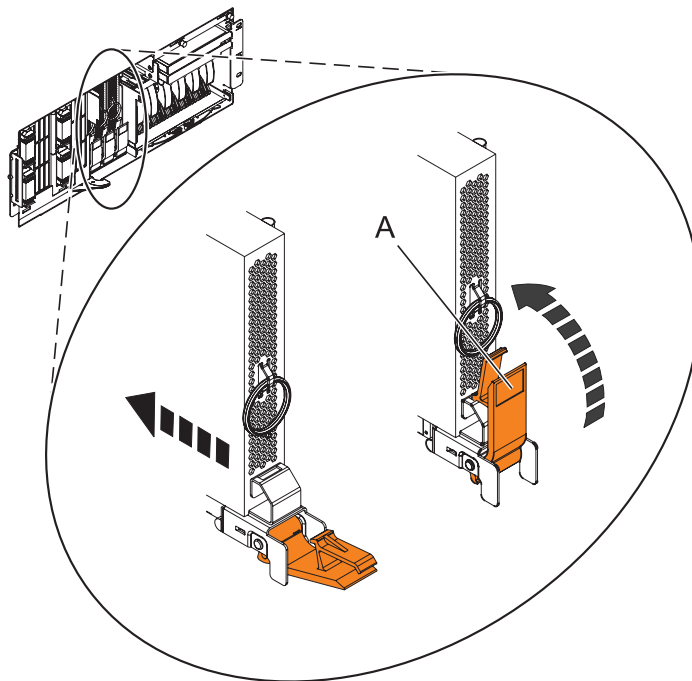
24. Install the System Backplane Assembly

1. Align the system backplane assembly with the slot in the system.
2. Slide the system backplane assembly into the system **(A)**.
3. Push the blue lever **(B)** to the right and in toward the system to lock the system backplane assembly.



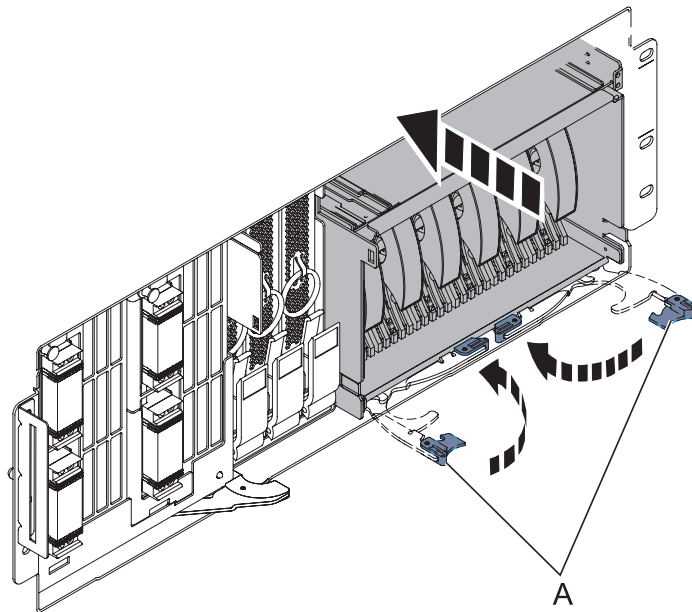
25. Install the Voltage Regulator Assemblies

1. Ensure that the voltage regulator assembly latch **(A)** is rotated out and down into the unlocked position.
2. Carefully grasp the voltage regulator assembly and slide it into the enclosure.
3. When the voltage regulator assembly is all the way into the card enclosure, rotate the latch **(A)** up into the locked position.
4. Repeat these steps until all voltage regulator assemblies have been installed.



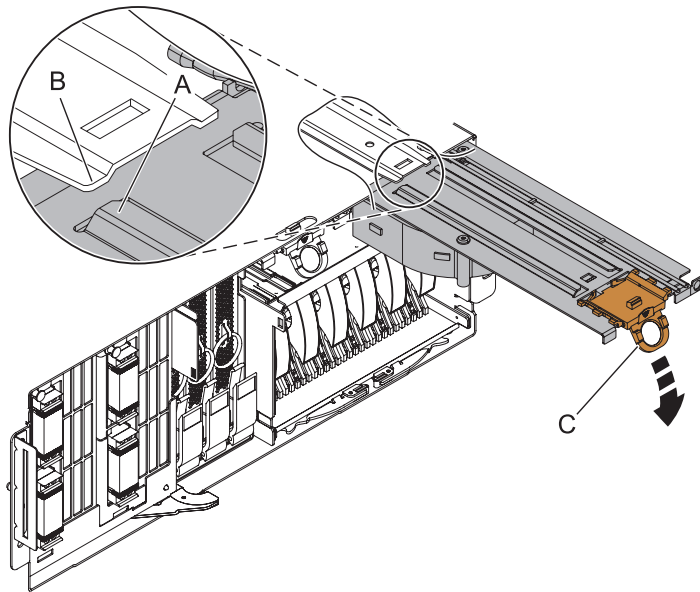
26. Install the disk unit enclosure

1. Insert the new disk unit enclosure into the system unit.
2. Slide the disk unit enclosure into the system until you feel it lock into place.
3. Rotate the handles **(A)** in the direction shown.



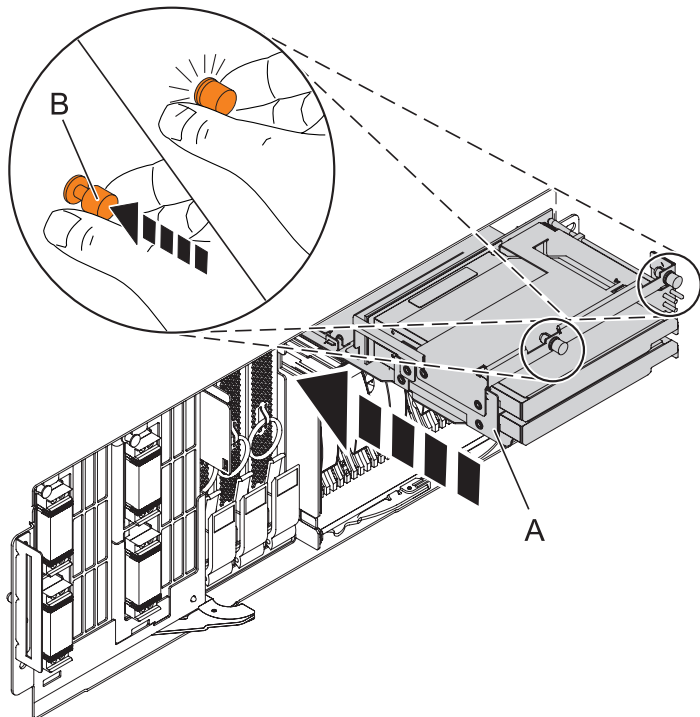
27. Install the Fans

1. Align the fan **(A)** with the guide rails **(B)** inside of the fan slot.
2. Press the fan all the way into the fan slot.
3. Lift up the ring **(C)** to lock the fan into place.
4. Repeat these steps until both fans are installed.



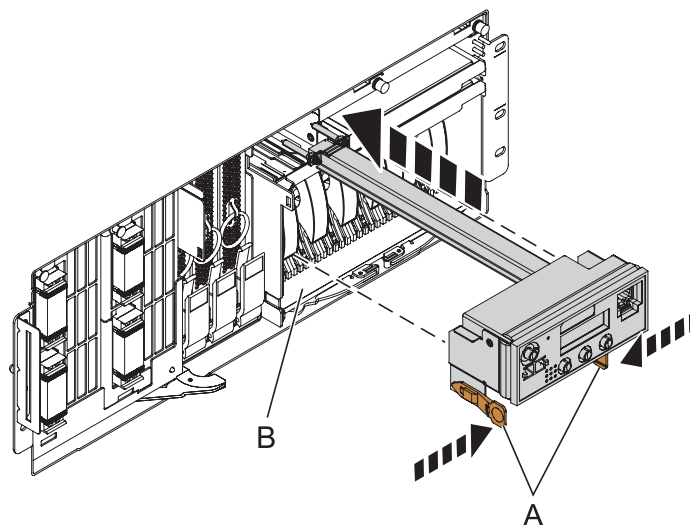
28. Install the Media Device Enclosure

1. Align the media device enclosure with the chassis opening.
2. Push the media device enclosure **(A)** into place, then push the two terra-cotta locking knobs **(B)** into the locked position.



29. Install the Control Panel or Control Panel Filler

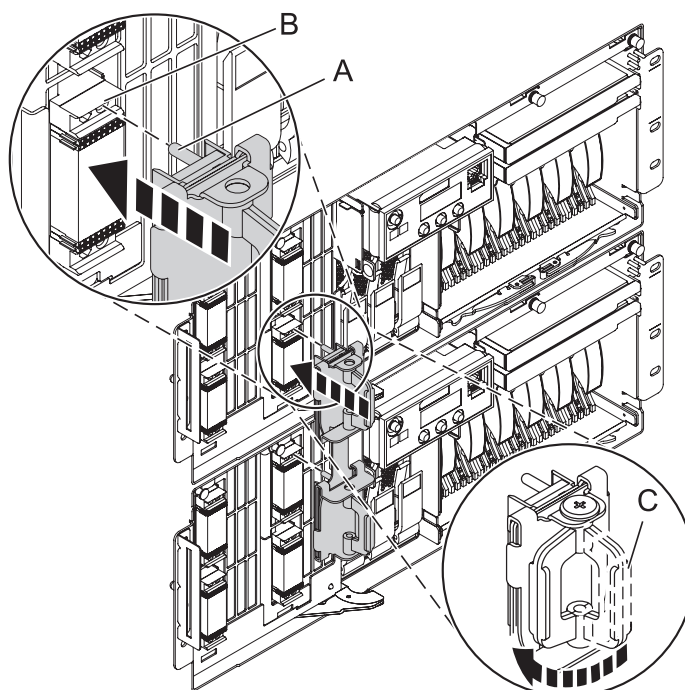
In the enclosure you are servicing, carefully slide the control panel or if present, control panel filler, into the control panel bay (B) until you feel the locking tabs (A) lock in place.



30. Connect SMP Cable if installed

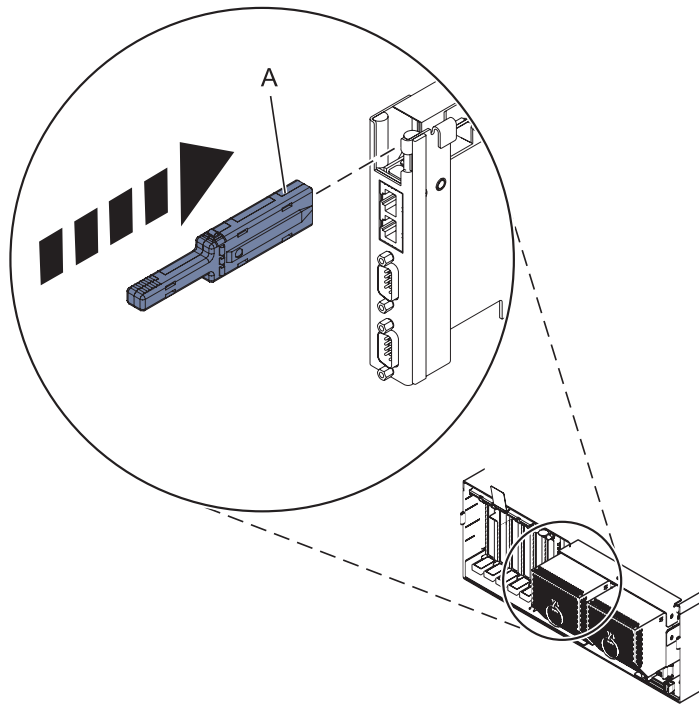
1. Align the guide pins (A) with the connectors (B) on the system unit.
2. Using the handle (C), carefully push the SMP processor cable into the system unit connector.

Repeat these steps for all SMP cable connectors that are present on the system you are servicing.



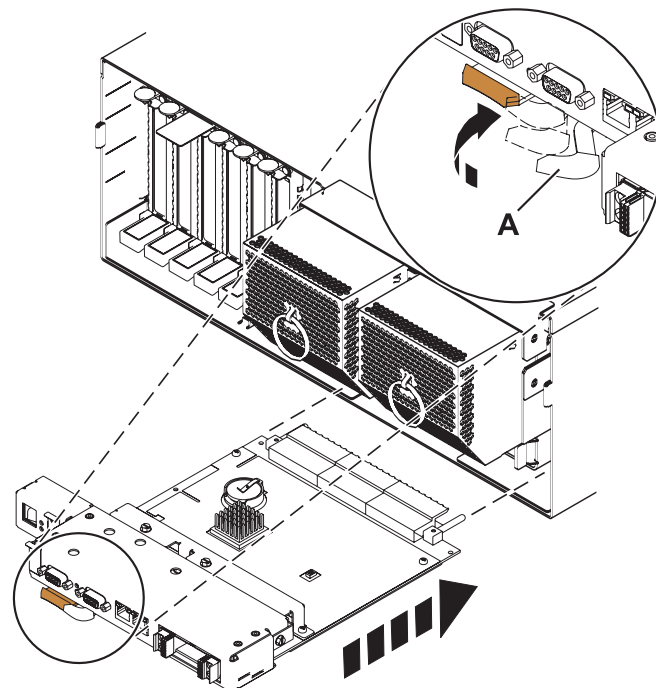
31. Install the VPD Card

1. Insert the VPD card with the key **(A)** positioned to the right as shown.
2. Push until fully seated.



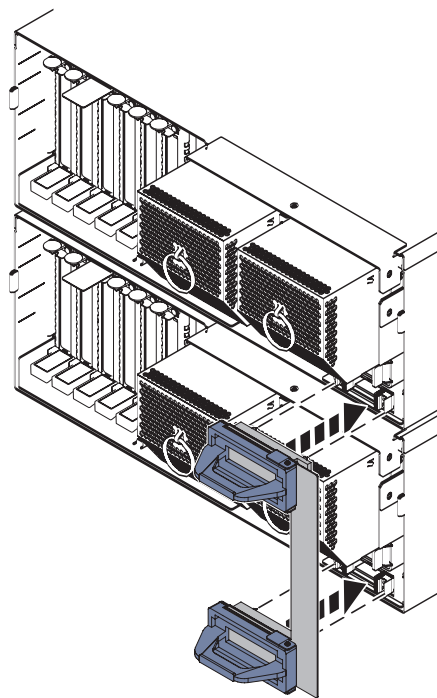
32. Install the Service Processor Assembly

1. Align the service processor assembly with the card slot.
2. Slide the service processor assembly all the way into the card slot in the card enclosure.
3. Push the handle **(A)** towards the service processor assembly until the release tab locks the handle in place. This will secure the service processor assembly into the card slot.
4. Reconnect all service processor assembly cables.



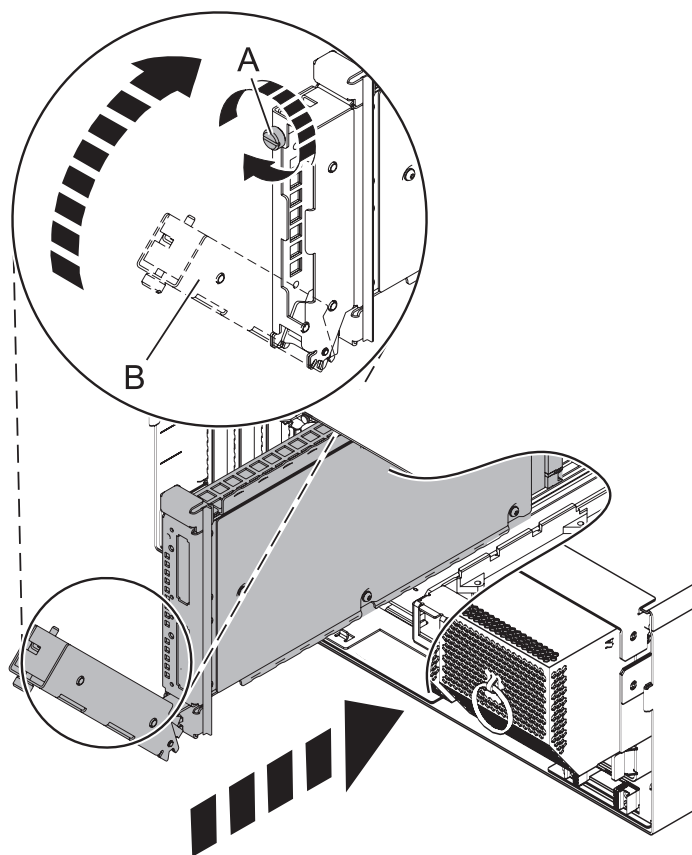
33. Install the Service Processor Cable if removed

1. Align the pins on the back of the service processor cable handle with the alignment holes on the back of one of the system units.
2. Using the handle, push the cable connector in place.
3. Repeat the process for the other system unit.



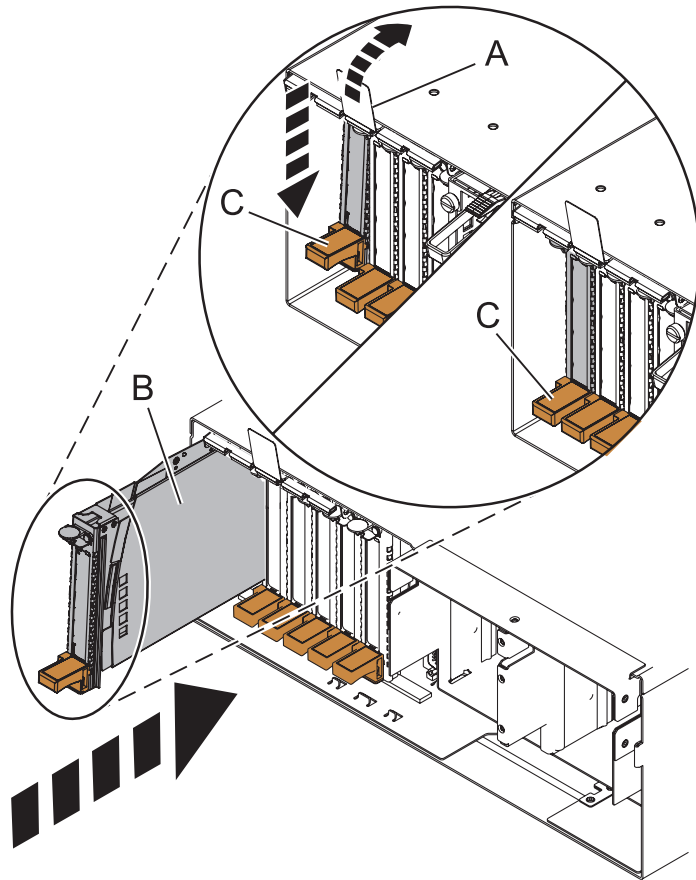
34. Install the HSL/RIO Adapter Card

1. Push the card into its slot.
2. Push the handle **(B)** up and toward the system until the handle stops against the adapter card.
3. Rotate the thumbscrew **(A)** clockwise to fasten the card.
4. Repeat these steps to install a second NIC Card if necessary.



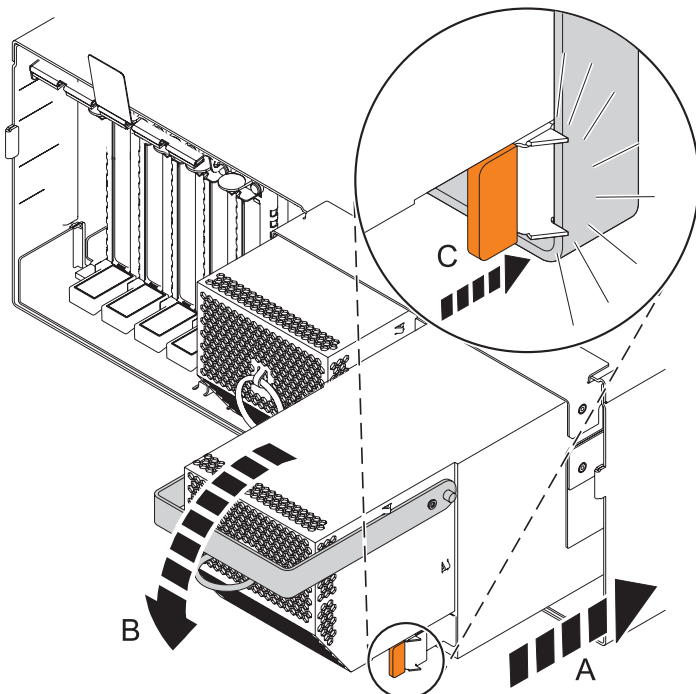
35. Install all PCI Adapter Cards

1. At the back of the system, identify the cassette slot you want to use.
2. Ensure the cassette handle is in the open position.
3. Lift and hold the PCI adapter EMC shield **(A)** in the open position.
4. Slide the cassette **(B)** into the cassette slot as shown.
5. When the cassette is fully inserted into the system, firmly press downward on the lower cassette handle **(C)**.
6. Lower the PCI adapter EMC shield into the closed position.
7. Repeat these steps until all PCI Adapter Cards or PCI Adapter Fillers in slots C1 through C5 have been installed.
8. Install all previously removed PCI cables to the rear of the system.



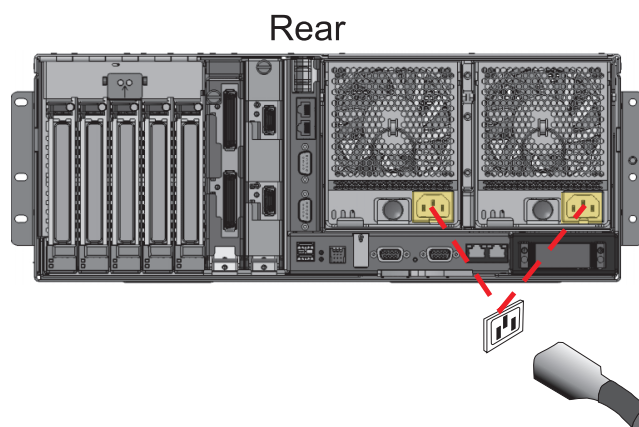
36. Install both power supplies

1. With the handle and latch in the open position, place the power supply in the power supply bay **(A)**.
2. Push the power supply completely into the power supply bay.
3. Close the handle **(B)**, and then push the handle latch into the closed position **(C)**.
4. Repeat these steps until both power supplies are installed.



37. Connect both power cords

Connect BOTH power cords to the enclosure.



38. Access the ASMI

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power. The ASMI may also be referred to as the service processor menus.

To access the ASMI, refer to "Accessing the ASMI" on page 702.

When you have accessed the ASMI, continue with the next step.

39. Set System Enclosure Type

The enclosure serial number is stored in the I/O backplane. When an I/O backplane is replaced, the seven digit serial number printed on a bar-coded label on the system unit, needs to be manually inputted and stored in the new I/O backplane using ASMI.

Note: To perform this operation, your authority level must be Administrator or Authorized Service Provider.

To input the enclosure serial number:

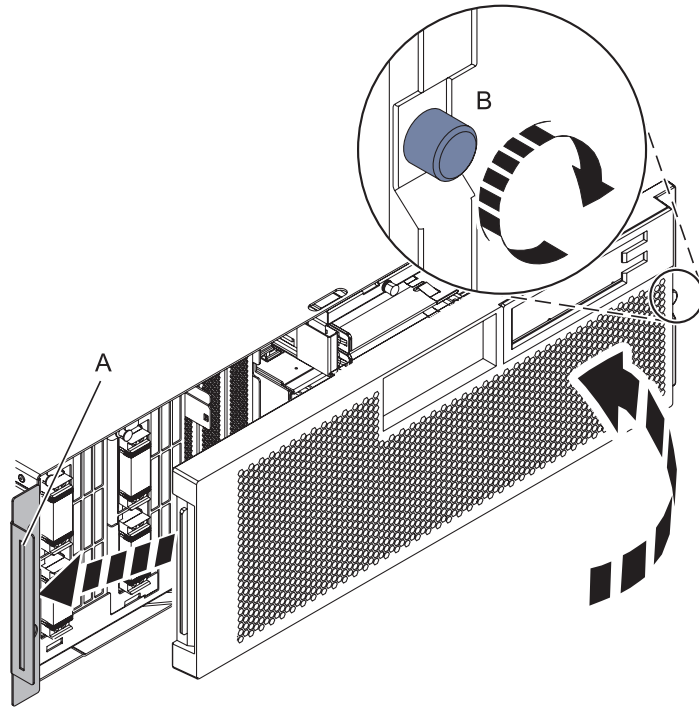
1. On the ASMI Welcome pane, specify your user ID and password, and click "Log In".
 2. In the navigation area, expand "System Configuration" and "Program Vital Product Data".
 3. Select "System Enclosures". In the right pane, the current system enclosures are displayed.
 4. On the system being serviced, record the enclosure serial number printed on the bar-coded label on the system unit.
 5. Enter the enclosure serial number recorded from the system unit in the "Enclosure serial number" field.
 6. Click "Save settings" to update and save the enclosure serial number.
-

40. Close the back rack door

Close the back rack door.

41. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot **(A)** on the left side of the system unit.
2. Tighten the thumbscrew **(B)** on the right side of the cover.
3. Close the front rack door.

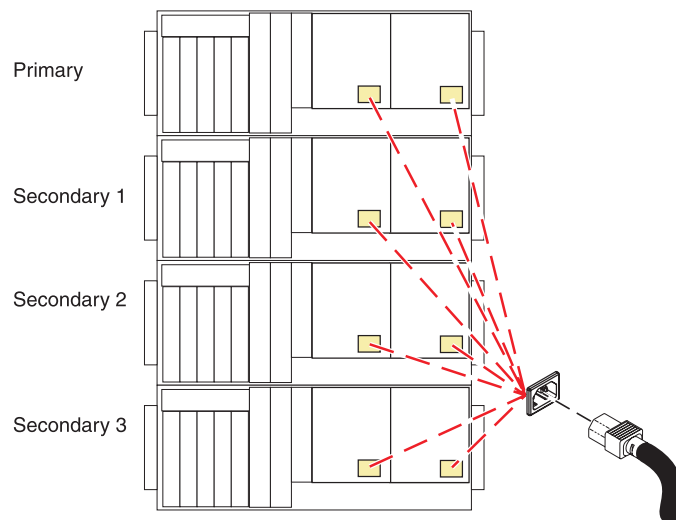


42. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



43. **Verify the repair**

Go to Chapter 5, “Verifying a repair,” on page 611.

Media device enclosure

Use this procedure to service the media device enclosure.

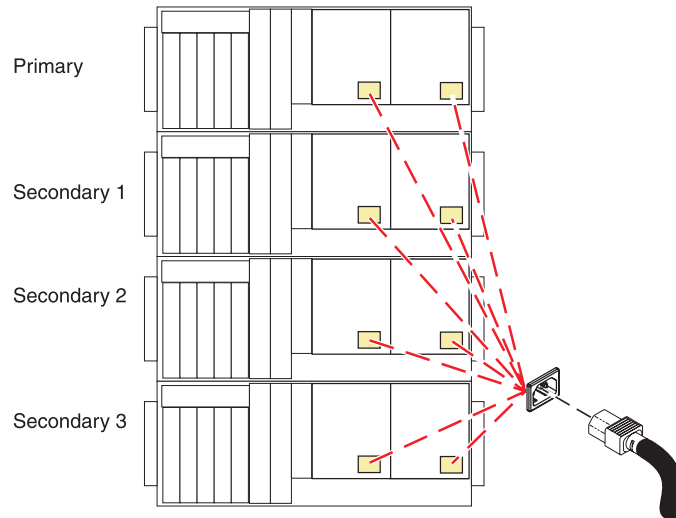
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

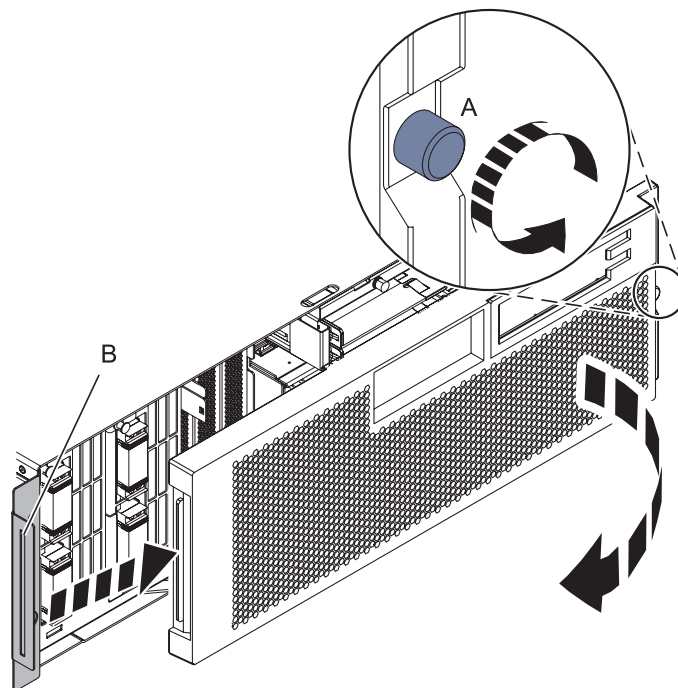
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



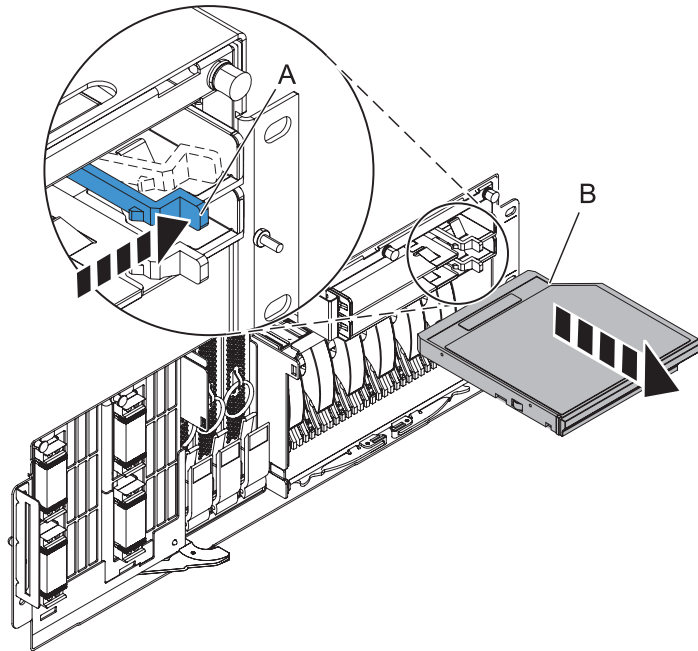
2. Remove the Front Cover

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



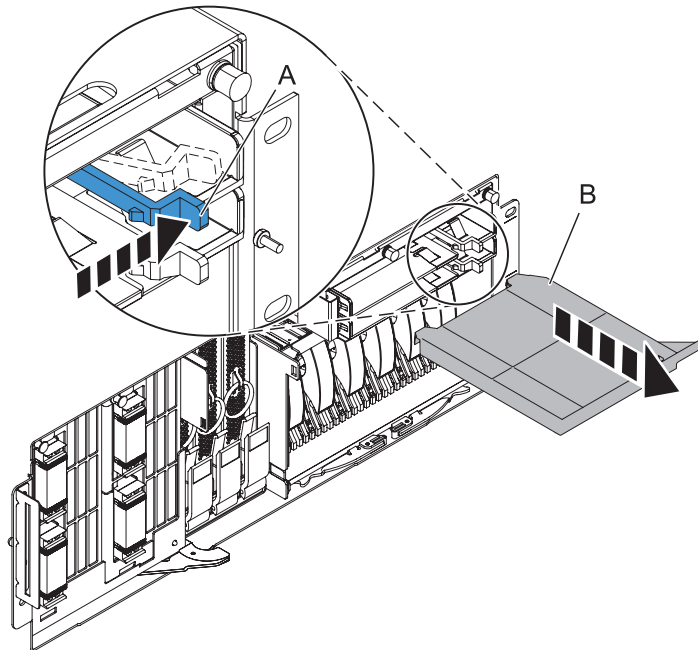
3. Remove the removable media device

If there is a media device present in the media-device enclosure, while pushing out on the blue plastic retaining tab **(A)**, pull the device **(B)** out of the system unit. Repeat this step if more than one media device is present in the media-device enclosure.



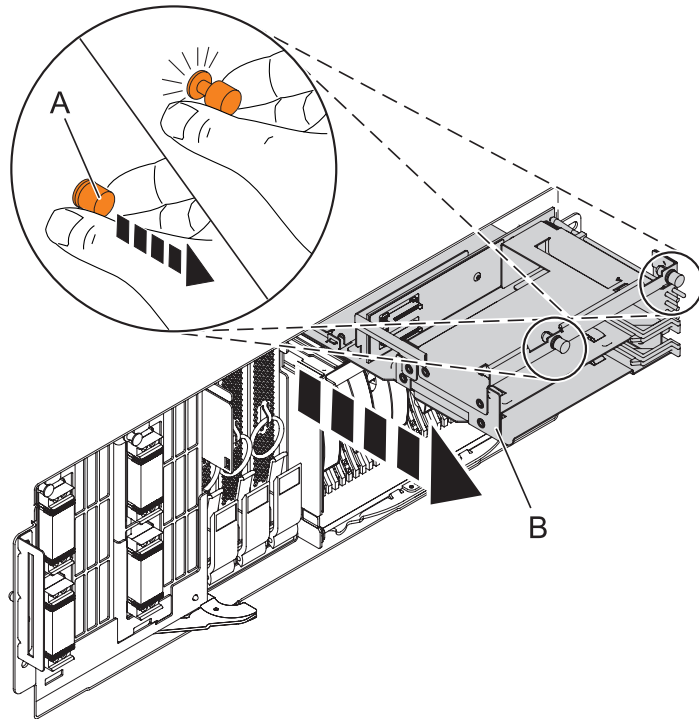
4. Remove the filler panel

If there is a filler panel present in the media-device enclosure, while pushing out on the blue plastic retaining tab **(A)**, pull the filler panel **(B)** out of the system unit. Repeat this step if more than one filler panel is present in the media-device enclosure.



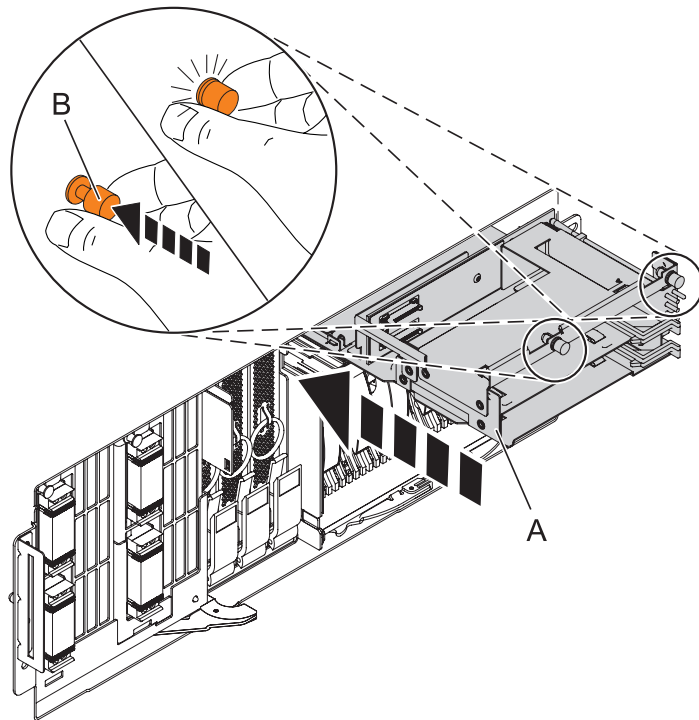
5. Remove the Media Device Enclosure

1. Pull the two terra-cotta locking knobs **(A)** out until they unlock.
2. Pull the enclosure **(B)** out of the system chassis.



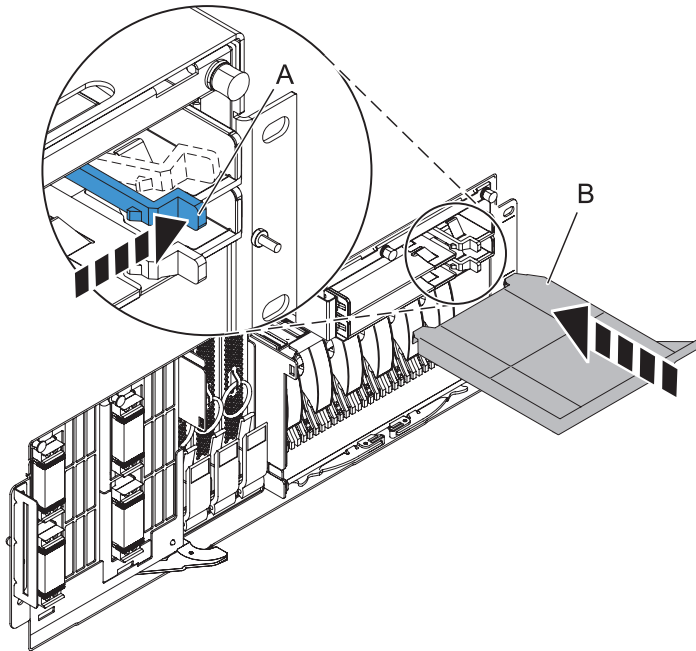
6. Install the new media device enclosure

1. Align the media device enclosure with the chassis opening.
2. Push the media device enclosure **(A)** into place, then push the two terra-cotta locking knobs **(B)** into the locked position.



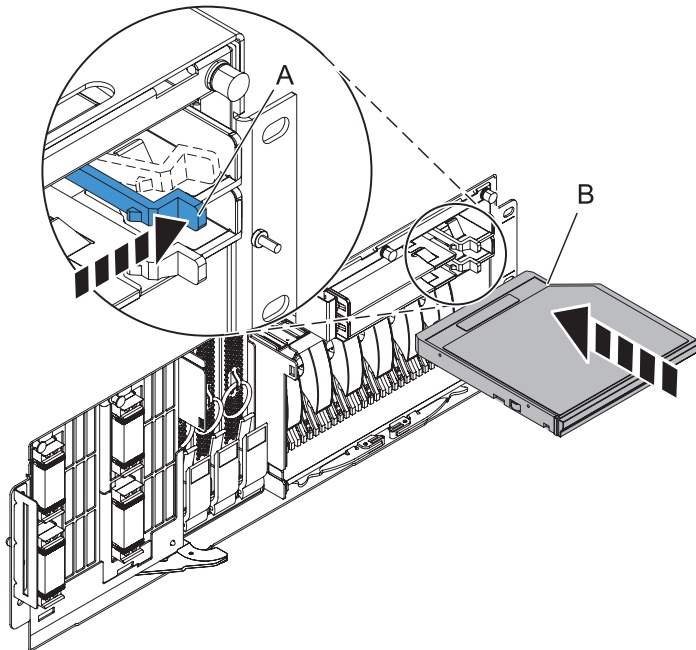
7. Install the filler panel

If there was a filler panel present in the media-device enclosure, while pushing out on the blue plastic retaining tab **(A)**, push the filler panel **(B)** fully into the system. Repeat this step if more than one filler panel was present in the media-device enclosure.



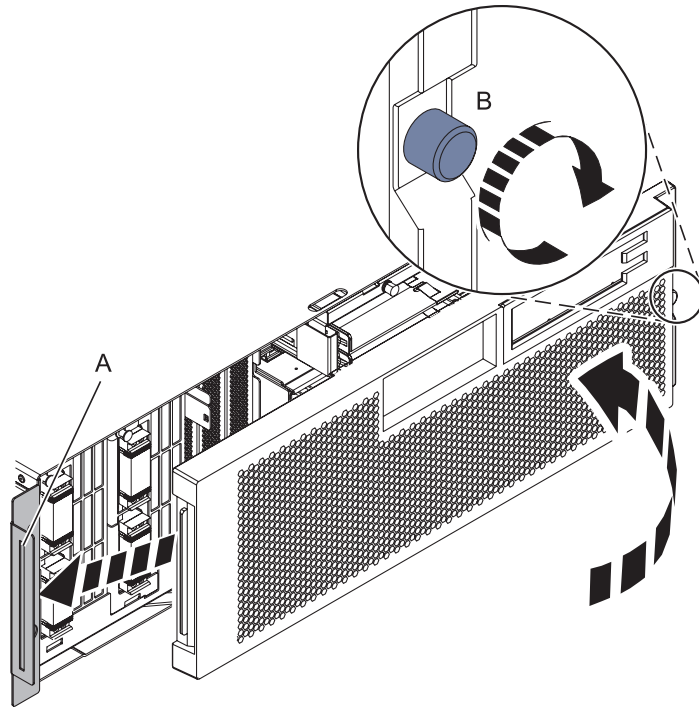
8. Install the removable media device

If there was a media device present in the media-device enclosure, while pushing out on the blue plastic retaining tab **(A)**, push the device **(B)** fully into the system. Repeat this step if more than one media device was present in the media-device enclosure.



9. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot **(A)** on the left side of the system unit.
2. Tighten the thumbscrew **(B)** on the right side of the cover.
3. Close the front rack door.

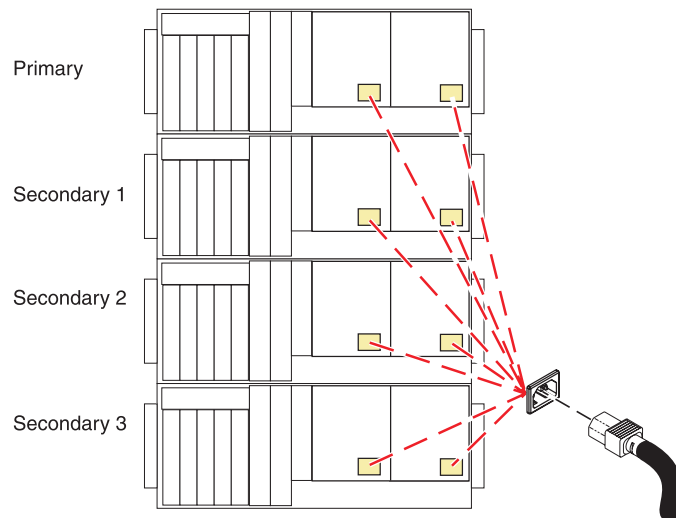


10. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



11. Verify the repair

Go to Chapter 5, "Verifying a repair," on page 611.

Memory DIMM

Use this procedure to service the memory DIMM.

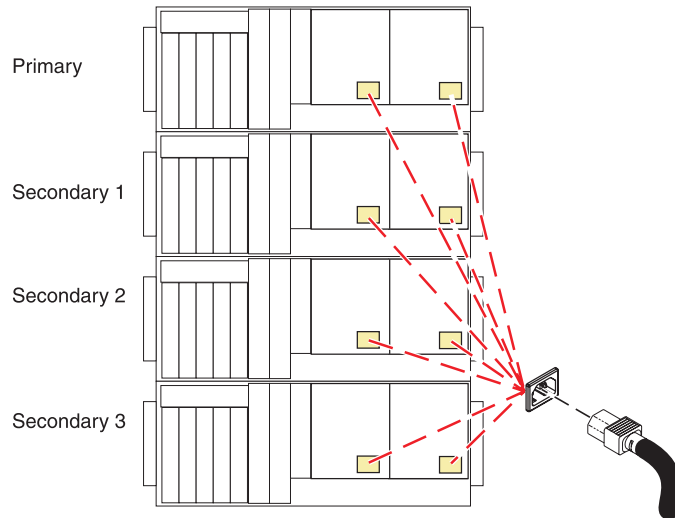
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

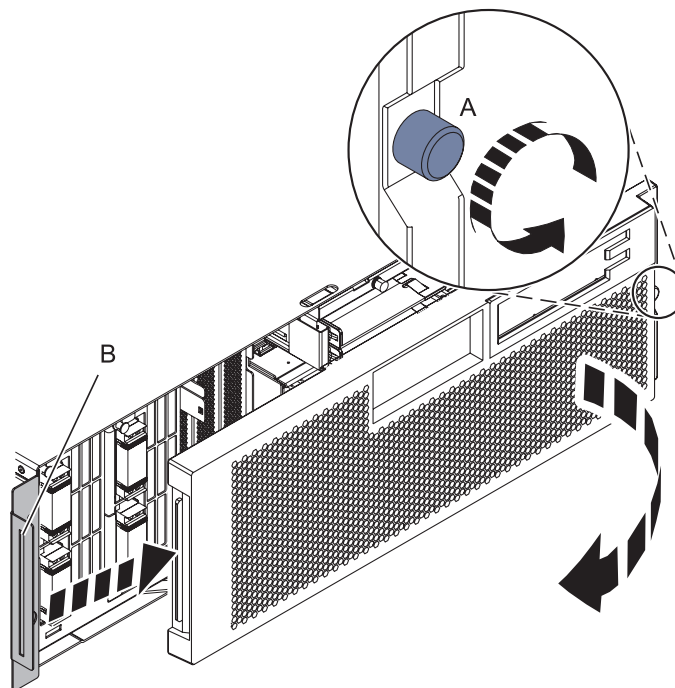
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



2. Remove the Front Cover

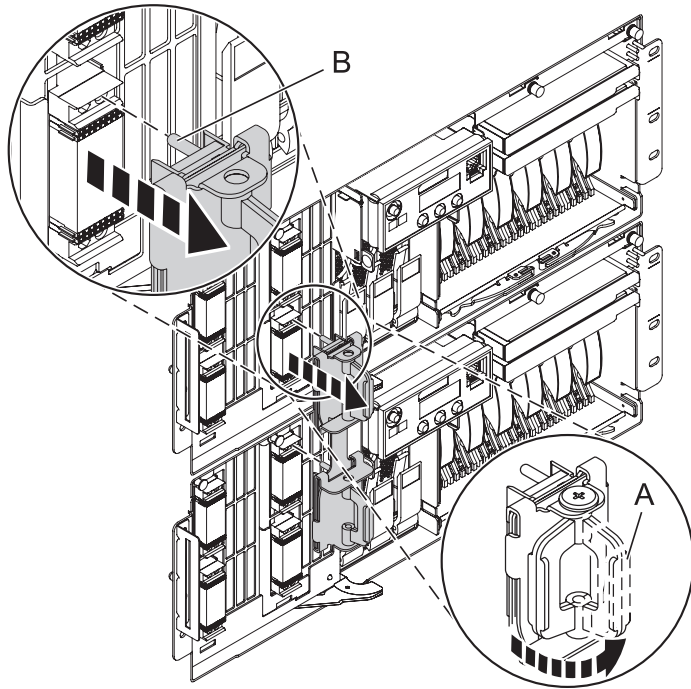
1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



3. Disconnect SMP Cable

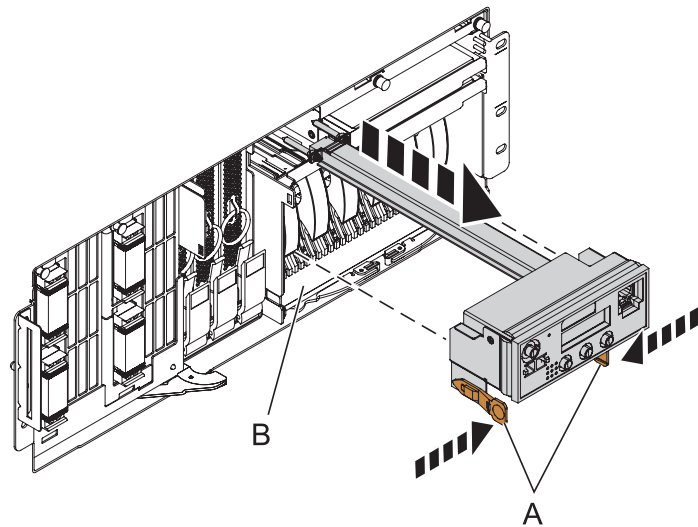
1. Carefully pull the handle **(A)** from the system until the connector is unseated.
2. When the guide pins **(B)** are free, carefully pull the SMP processor cable away from the system unit.

Repeat these steps for all SMP cable connectors that are present on the system you are servicing.



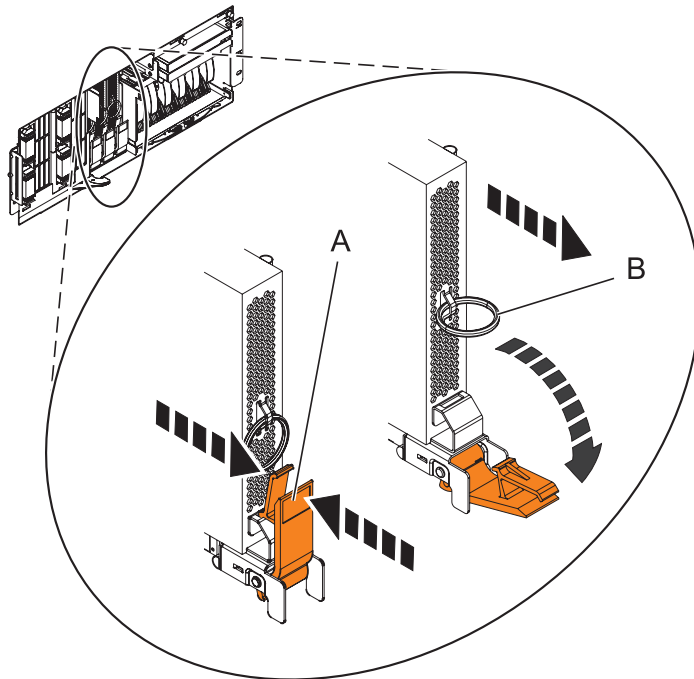
4. Remove the Control Panel or Control Panel Filler

In the enclosure you are servicing, remove the control panel or if present, control panel filler, by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges, and pulling it out of its bay **(B)**.



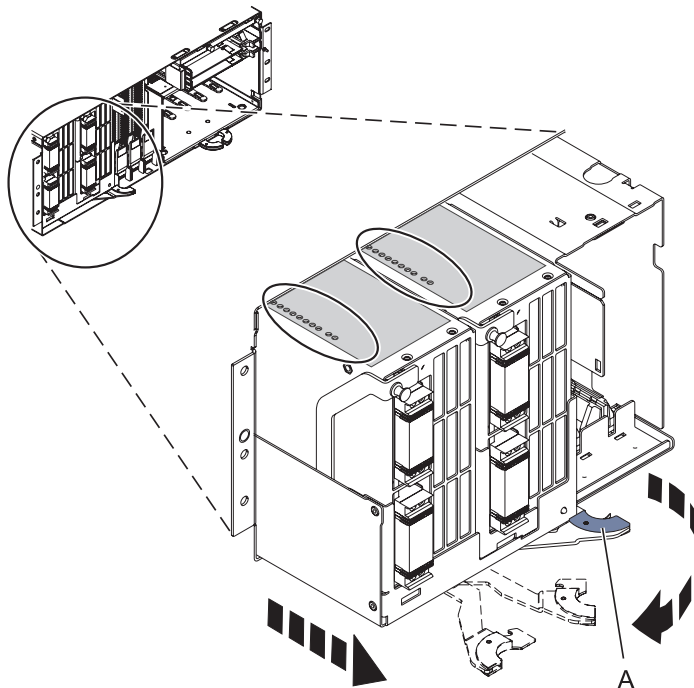
5. Remove the Voltage Regulator Assemblies

1. Squeeze the top of the latch **(A)** to release it, then rotate the latch out and then down.
2. Grasp the pull ring **(B)** and slowly pull the voltage regulator out of the enclosure.
NOTE: Pulling the voltage regulator assembly out of the card enclosure requires a large amount of force. The voltage regulator assembly is of substantial weight, so grasp it firmly when it is free of the card enclosure.
3. Repeat these steps until all voltage regulator assemblies have been removed.



6. Remove the System Backplane Assembly

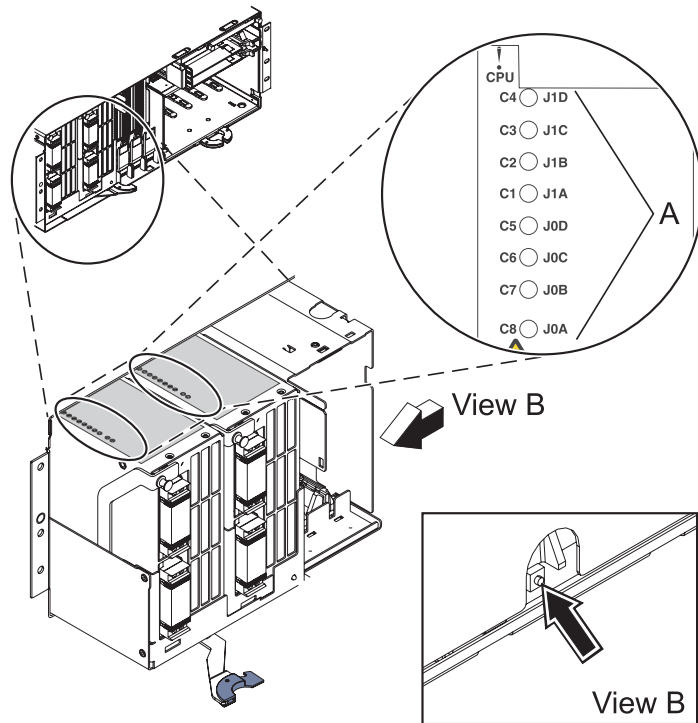
1. Push the blue lever to the left and out from the system **(A)** to unlock the system backplane assembly.
2. Pull the system backplane assembly out of the system using both hands.
ATTENTION: The system backplane assembly weighs 35 lbs and should not be pulled out using the blue lever. Grasp the backplane assembly firmly with both hands when it is free of the system.



7. Identify the Failing DIMM

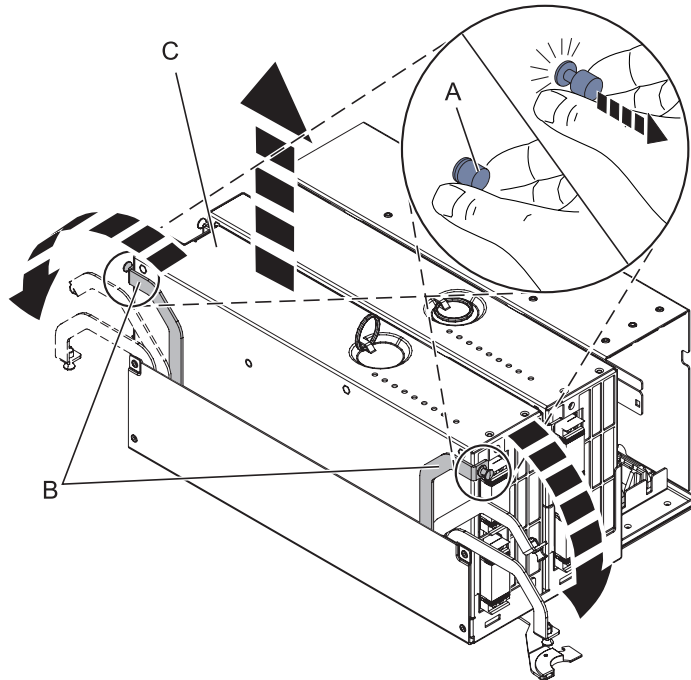
If you are removing the DIMMs because of a system failure, look at the LEDs **(A)** located on top of the system processor assemblies to identify the location of the failing DIMMs. To illuminate the location LED for the failing DIMM, press the LED actuator button **(B)**.

ATTENTION: The actuator button must be used within 20 minutes after the system backplane assembly is removed from the system. The assembly retains the energy to light the LEDs for 40 seconds after the actuator button has been pressed.



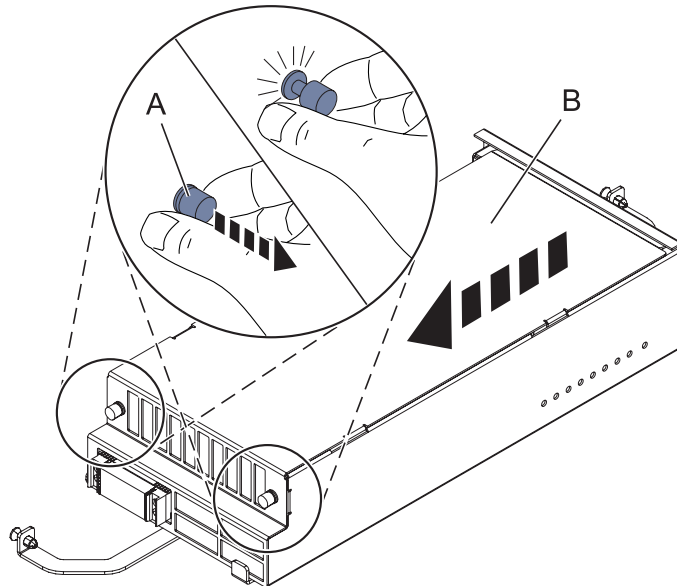
8. Remove the System Processor Assembly

1. Pull the locking knobs **(A)** out to the unlocked position.
2. Push the locking arms **(B)** down and out to unlock the processor card assembly.
3. Lift the processor card assembly **(C)** out of the system backplane assembly.



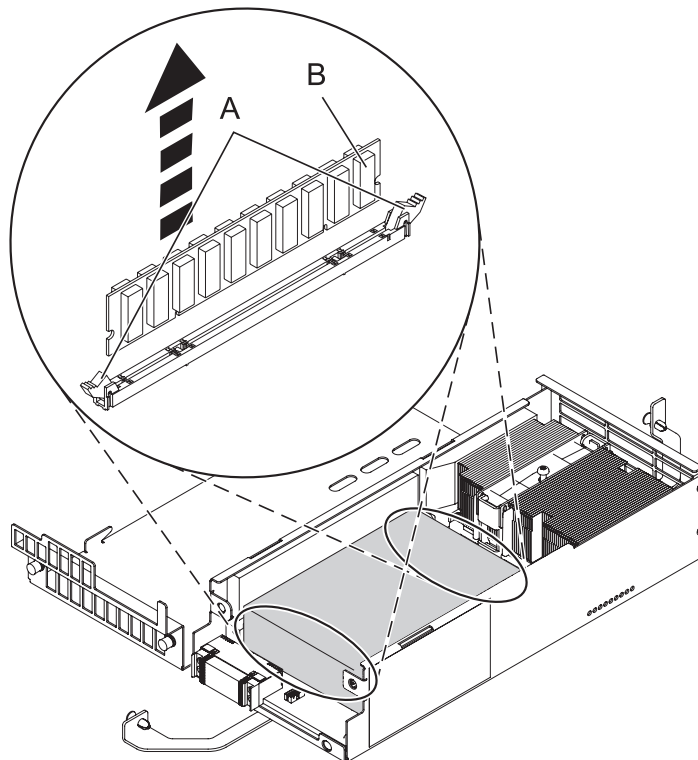
9. Remove the System Processor Assembly Cover

1. Unlock the two retaining knobs **(A)** on the system processor assembly.
2. Slide the cover **(B)** back.
3. Lift the cover off of the assembly.



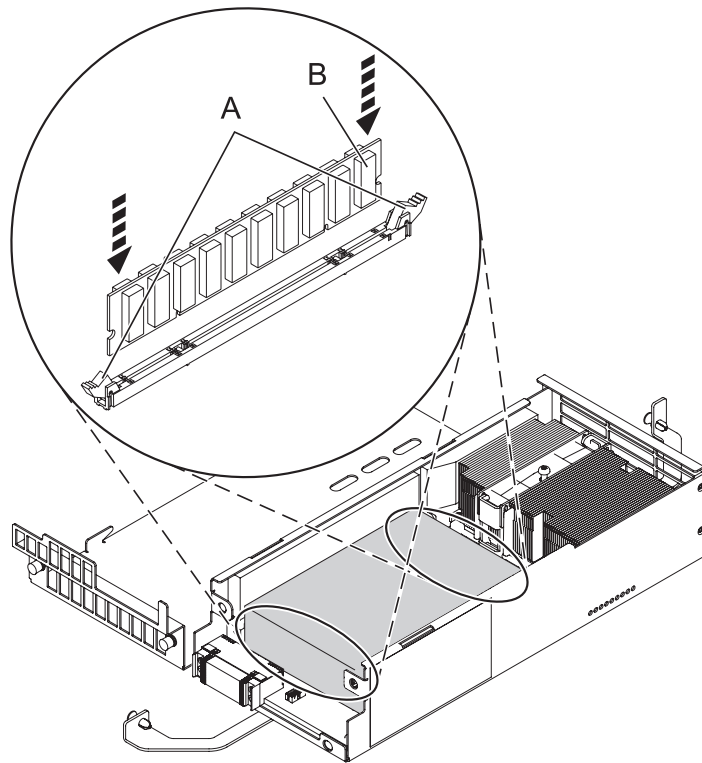
10. Remove the Memory DIMM

1. Remove the mylar cover, if installed, that is covering the memory DIMMs.
2. Locate the memory DIMM you want to remove.
3. Unlock the memory DIMM by pushing the connector tabs **(A)** out and then down. The tabs' lever action forces the memory DIMM **(B)** out of the connector.
4. Lift the memory DIMM out of the connector.



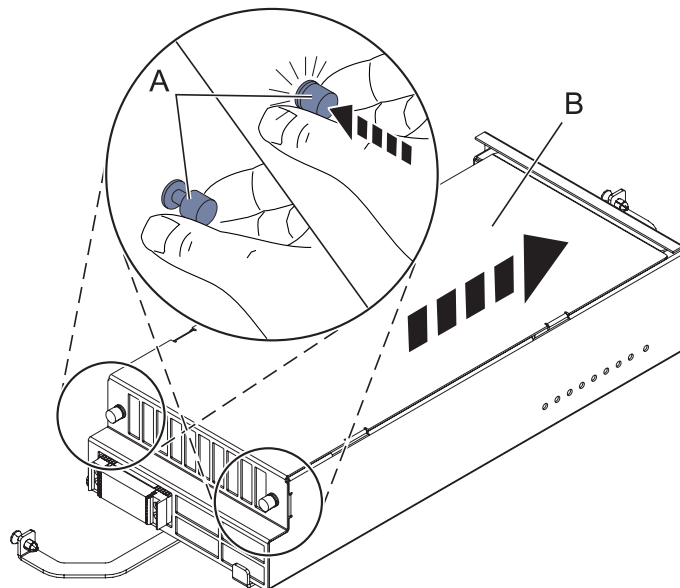
11. Install the Memory DIMM

1. Ensure that the connector locking tabs **(A)** are pushed out into the unlocked position before installing a new memory DIMM.
2. Carefully grasp the memory DIMM **(B)** along two edges and align it with the connector. **ATTENTION:** Memory DIMMs are keyed to prevent a DIMM from being installed improperly. Note the locations of the key tabs within the DIMM connector before attempting to install the DIMM.
3. Push the memory DIMM firmly into the connector until the connector locking tabs engage.
4. If you are installing any Tall DIMMs, place the mylar cover over the DIMMs in the processor card to prevent the DIMMs from contacting the lid. **NOTE:** If you replace Tall DIMMs with regular-sized modules, remove the mylar cover. Failing to remove the mylar cover might restrict airflow in the unit.



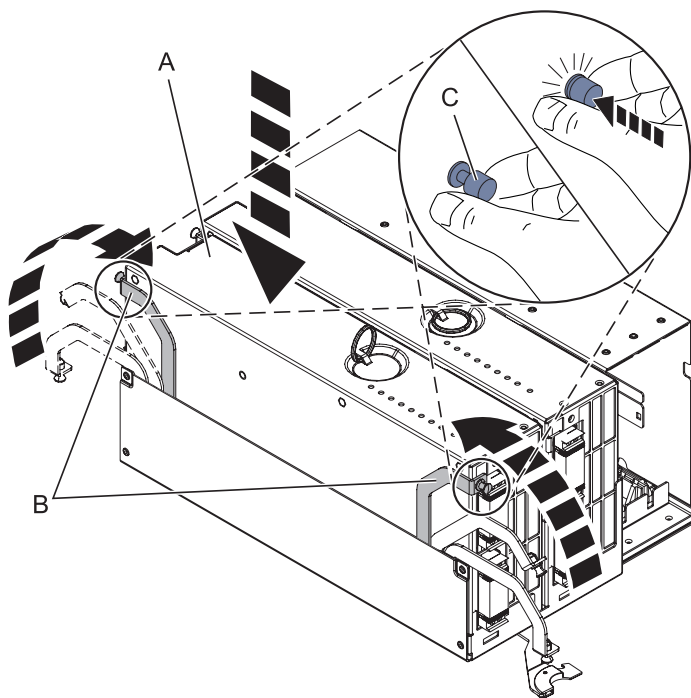
12. Install the System Processor Assembly Cover

1. Place the cover **(B)** on the system processor assembly.
2. Lock the two retention knobs **(A)**.



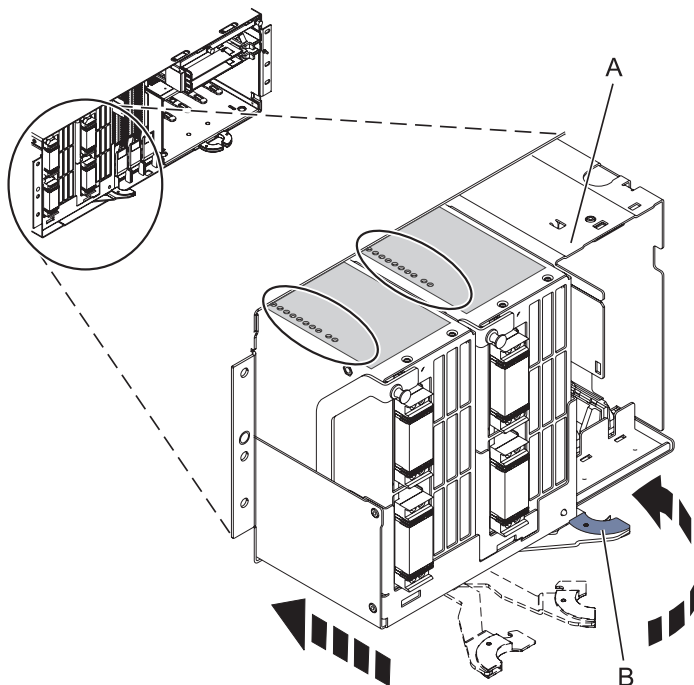
13. Install the System Processor Assembly

1. Place the processor assembly **(A)** into the system backplane assembly, and then lock it into place with the locking arms **(B)**.
2. Press the locking knobs **(C)** in to the locked position.



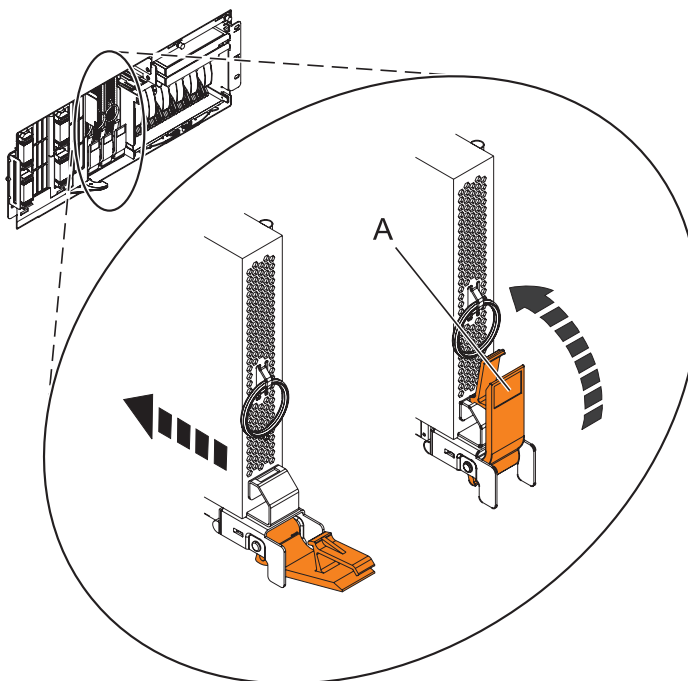
14. Install the System Backplane Assembly

1. Align the system backplane assembly with the slot in the system.
2. Slide the system backplane assembly into the system **(A)**.
3. Push the blue lever **(B)** to the right and in toward the system to lock the system backplane assembly.



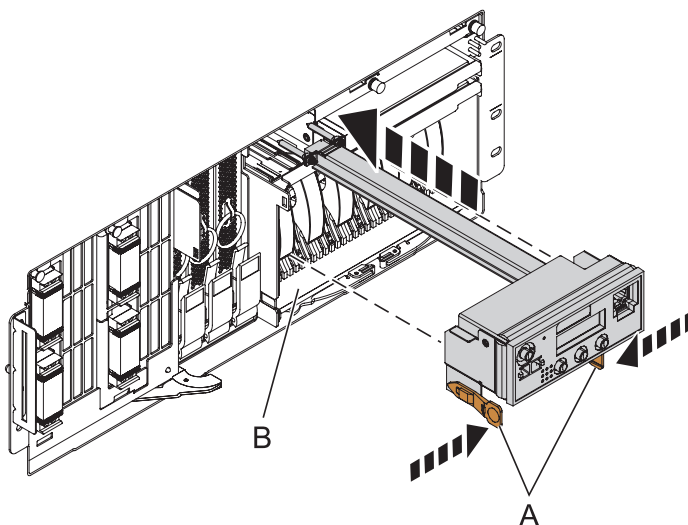
15. Install the Voltage Regulator Assemblies

1. Ensure that the voltage regulator assembly latch **(A)** is rotated out and down into the unlocked position.
2. Carefully grasp the voltage regulator assembly and slide it into the enclosure.
3. When the voltage regulator assembly is all the way into the card enclosure, rotate the latch **(A)** up into the locked position.
4. Repeat these steps until all voltage regulator assemblies have been installed.



16. Install the Control Panel or Control Panel Filler

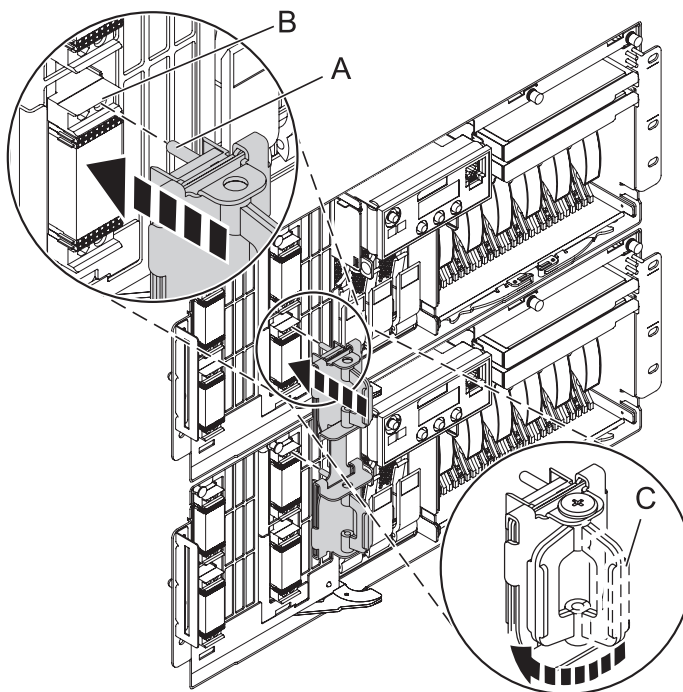
In the enclosure you are servicing, carefully slide the control panel or if present, control panel filler, into the control panel bay **(B)** until you feel the locking tabs **(A)** lock in place.



17. Connect SMP Cable

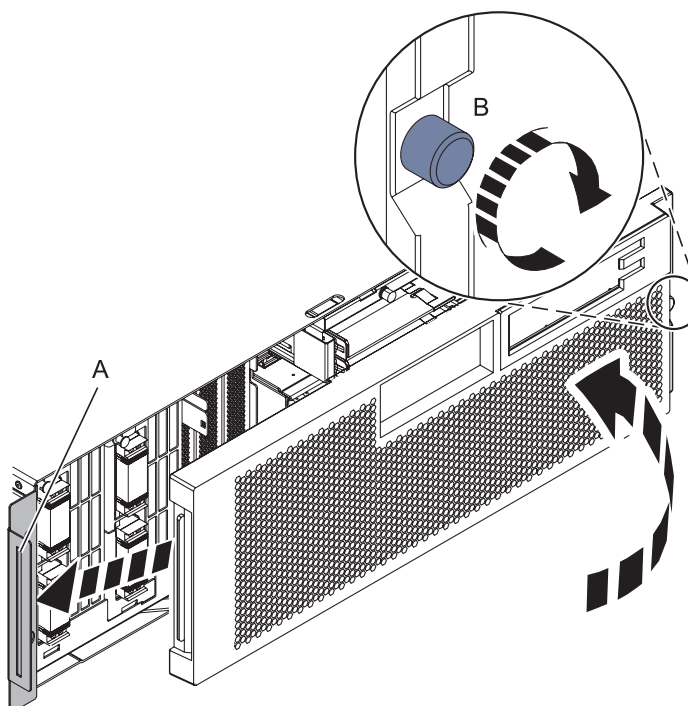
1. Align the guide pins **(A)** with the connectors **(B)** on the system unit.
2. Using the handle **(C)**, carefully push the SMP processor cable into the system unit connector.

Repeat these steps for all SMP cable connectors that are present on the system you are servicing.



18. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot **(A)** on the left side of the system unit.
2. Tighten the thumbscrew **(B)** on the right side of the cover.
3. Close the front rack door.

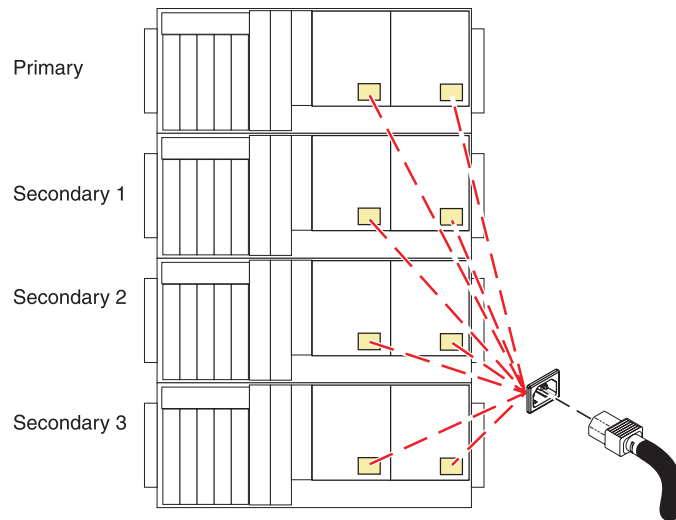


19. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



20. Verify the repair

Go to Chapter 5, “Verifying a repair,” on page 611.

RIO/HSL adapter / 12X host channel adapter

Use this procedure to service the HSL/RIO adapter or 12X host channel adapter.

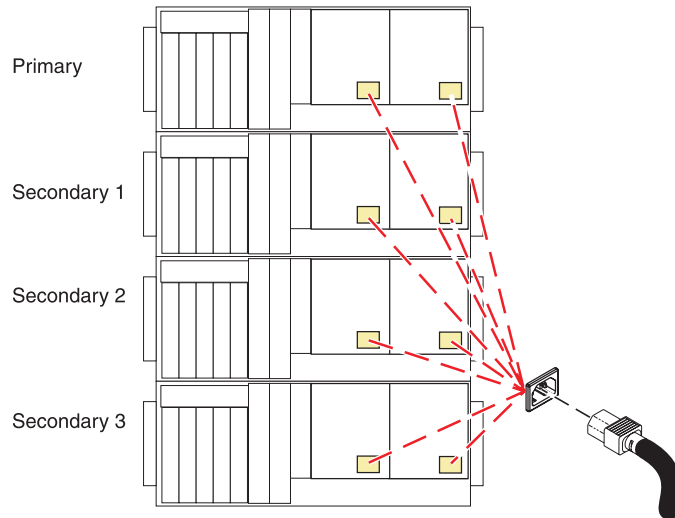
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.

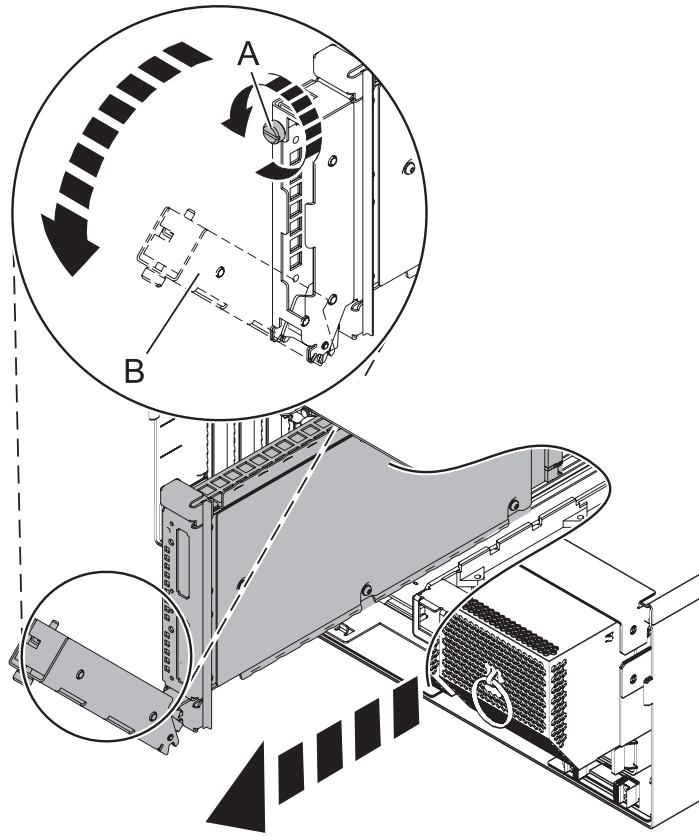


2. Open the back rack door

Open the back rack door.

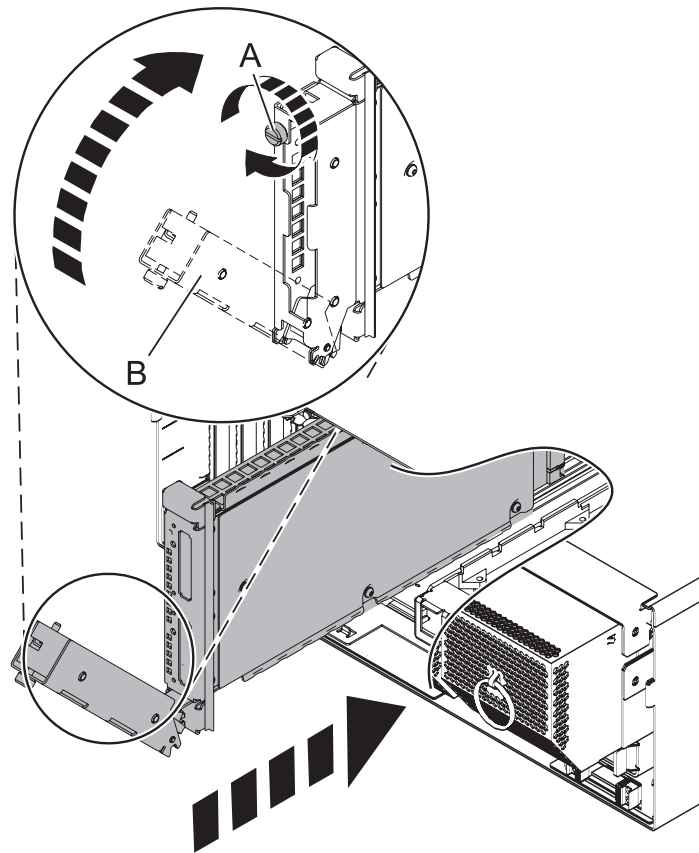
3. Remove the HSL/RIO Adapter Card

1. Label and Remove all HSL/RIO cables from the rear of the system.
2. Rotate the thumbscrew **(A)** counterclockwise to unfasten the card.
3. Pull the handle **(B)** down.
4. Pull the card from its slot.



4. Install the new HSL/RIO adapter

1. Push the card into its slot.
2. Push the handle **(B)** up and toward the system until the handle stops against the adapter card.
3. Rotate the thumbscrew **(A)** clockwise to fasten the card.
4. Connect the HSL/RIO cables to the card.



5. Close the back rack door

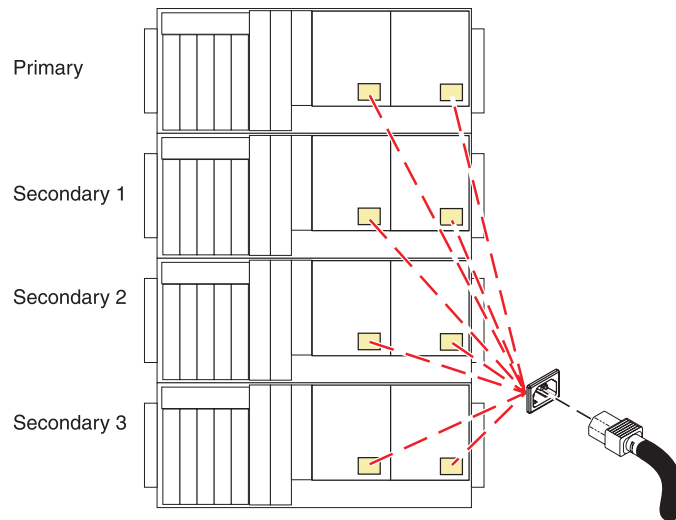
Close the back rack door.

6. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



7. Verify the repair

Go to Chapter 5, "Verifying a repair," on page 611.

PCI adapter

Use this procedure to service a PCI adapter.

1. Choose concurrent or nonconcurrent repair.

You may service a PCI adapter concurrently or nonconcurrently.

Will you be doing a concurrent repair?

No

↓

Yes

↓	Go to 478.

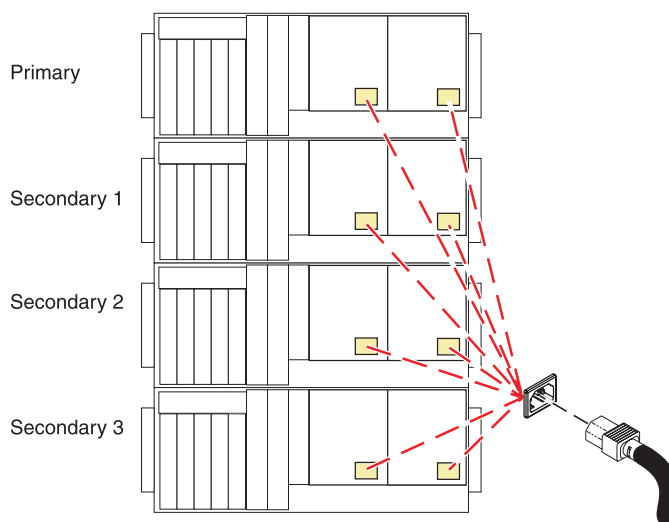
2. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.

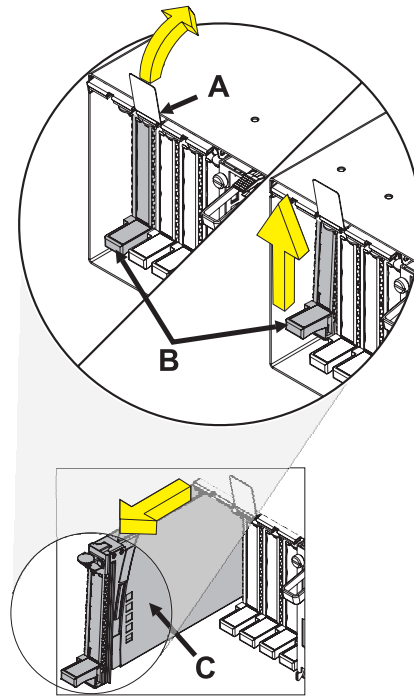


3. Open the back rack door

Open the back rack door.

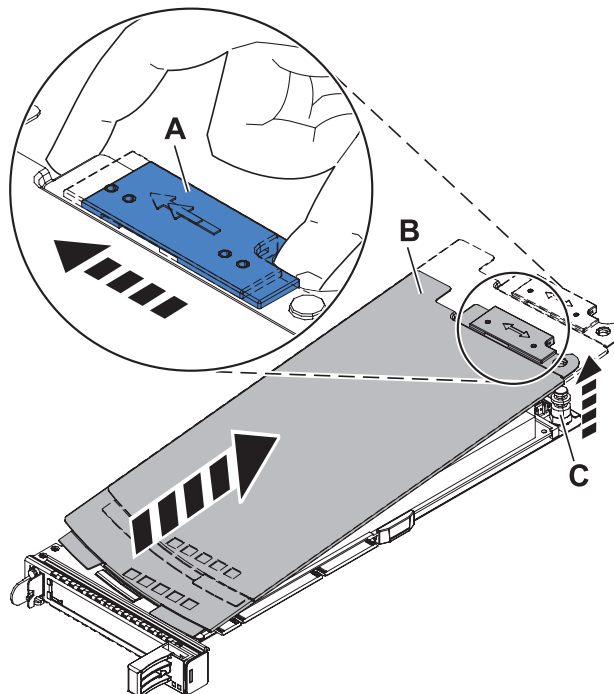
4. Remove the PCI card

1. Lift and hold the PCI adapter EMC shield **(A)** in the open position.
2. Lift the lower cassette handle up **(B)** as shown.
3. Pull the PCI cassette **(C)** out of the system unit.
4. Lower the PCI adapter EMC shield into the closed position.
5. Set the cassette aside with the cover facing up.



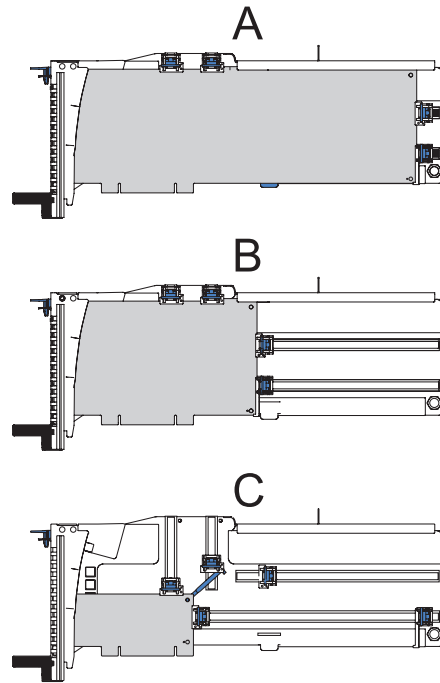
5. Remove the PCI card cassette cover

1. Slide the cover latch **(A)** to disengage it from the pivot pin **(C)**.
2. Lift the cover **(B)** off of the pivot pin.
3. Slide the cover off of the cassette.
4. If servicing a double-wide cassette, unscrew pivot pin **(C)** and put it in a safe place.



6.

Select PCI Adapter type



Select the type of PCI adapter being serviced:

Long adapter (A)

Medium adapter (B)

Short adapter (C)

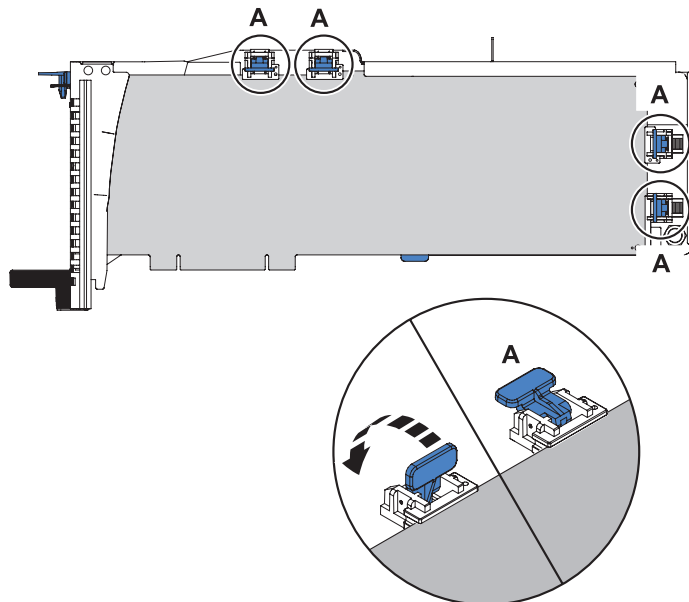
↓

Go to step 8 on page
473.

Go to step 9 on page
473.

7. Remove the long adapter

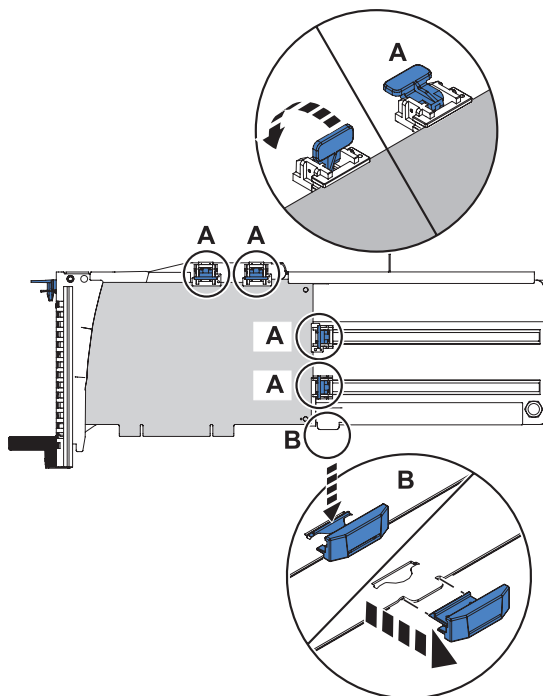
Unlock the retainers (**A**) by rotating them away from the card.



Go to step 10 on page 474.

8. Remove the medium adapter

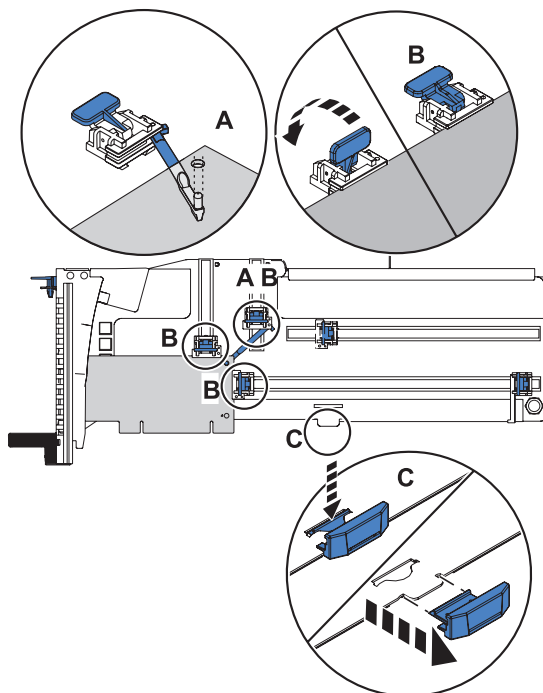
1. Unlock the retainers **(A)** and slide them away from the card.
2. Remove the adapter stabilizer **(B)**.



Go to step 10 on page 474.

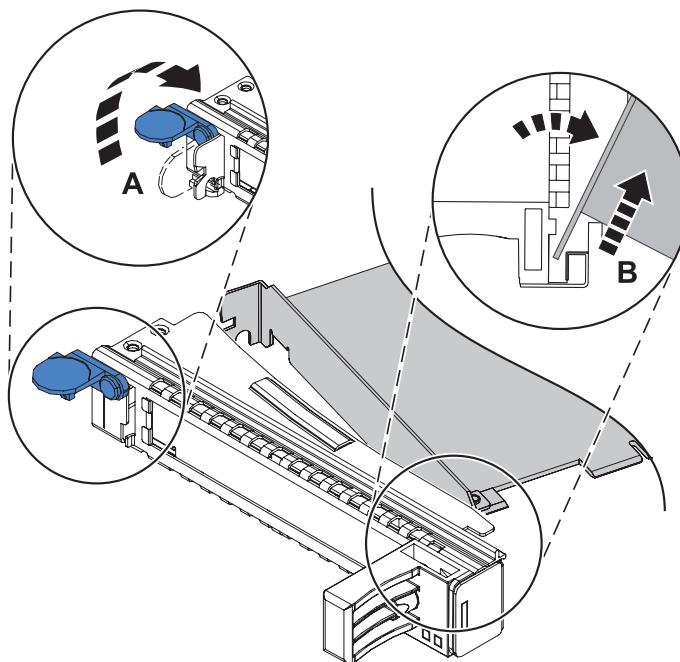
9. Remove the short adapter

1. Remove the hookarm **(A)** from the hole in the corner of the adapter.
2. Unlock the retainers **(B)** and slide them away from the card.
3. Remove the adapter stabilizer **(C)**.



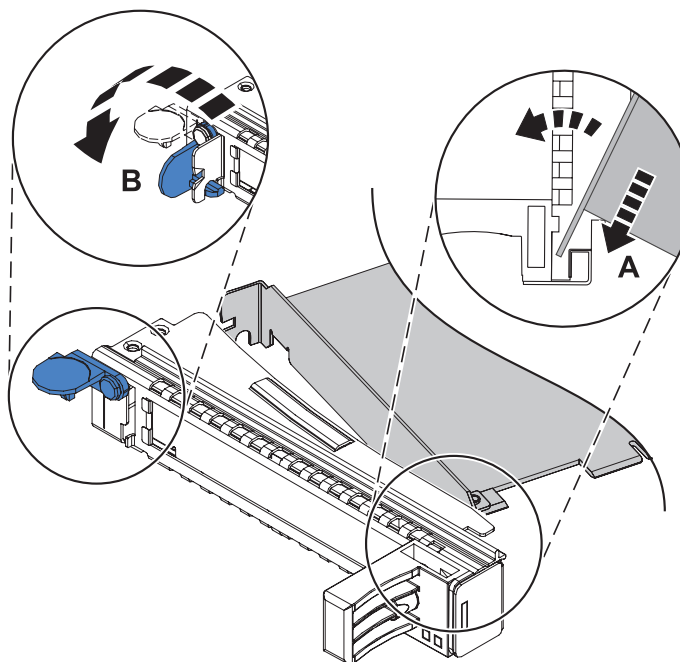
10. Remove the adapter from the cassette

1. Unlock the tailstock clamp **(A)** by rotating it into the open position.
2. Rotate the adapter out of the cassette by grasping the edge of the adapter opposite the tailstock, then firmly rotate the adapter towards the bottom of the cassette.
3. Pull the adapter out of the tailstock retaining channel **(B)**.
4. Put the adapter in a safe place.



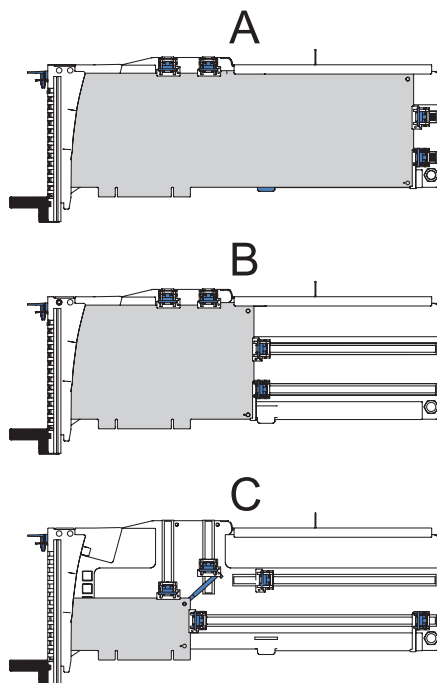
11. Install the PCI card

1. With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **(A)**.
2. Rotate the adapter towards the top of the cassette and into place.
3. Position the adapter retainers to support the adapter, then rotate the tailstock clamp **(B)** into the closed position.



12.

Select PCI Adapter type



Select the type of PCI adapter being serviced:

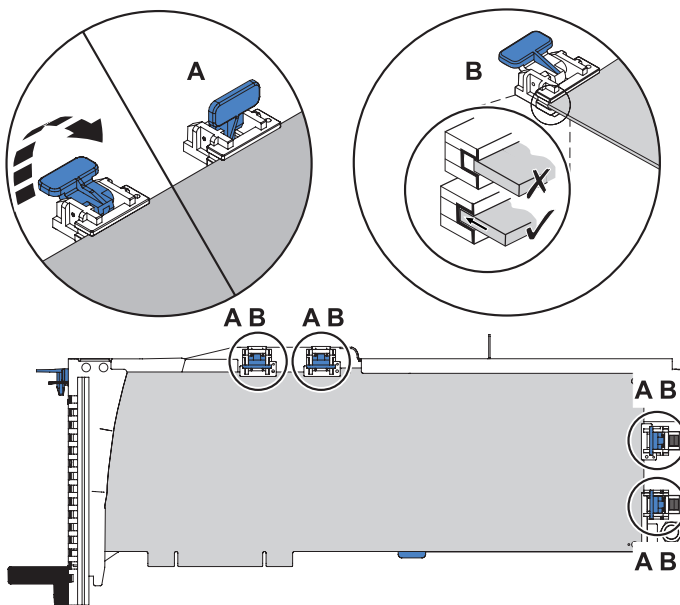
Long adapter (A)	Medium adapter (B)	Short adapter (C)
↓	Go to step 14 on page 476.	Go to step 15 on page 476.

13. Install the long adapter

1. Place and lock the retainers (A).

Attention: Use of the lower corner support retainer may inhibit the docking of the PCI card when positioned within the system unit. Ensure the retainer does not interfere with the adapter connectors on the system backplane.

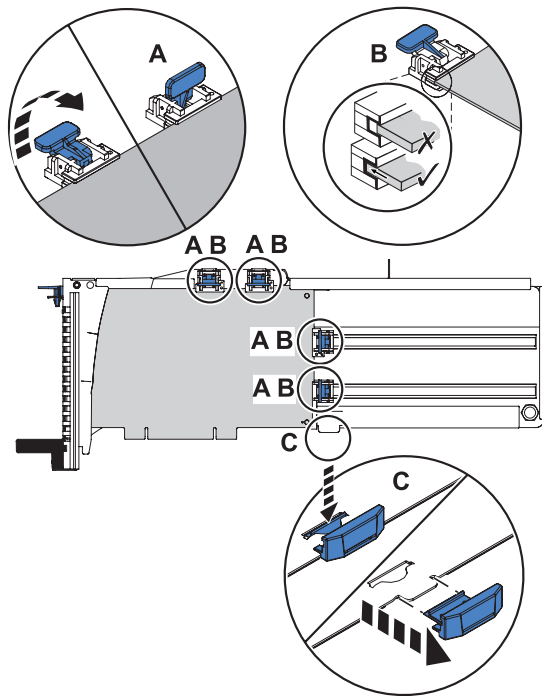
2. Ensure the adapter edge (B) is seated in each retainer groove.



Go to step 16 on page 477.

14. Install the medium adapter

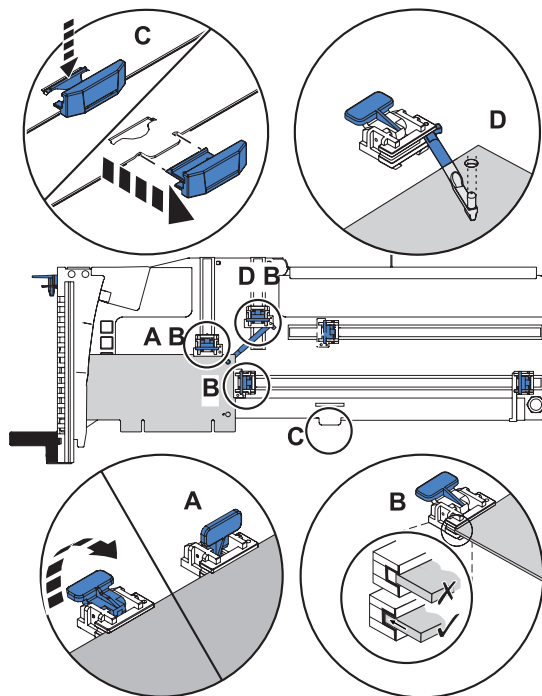
1. Remove the adapter stabilizer (**C**).
2. Place and lock the retainers (**A**).
3. Ensure the adapter edge (**B**) is seated in each retainer groove.



Go to step 16 on page 477.

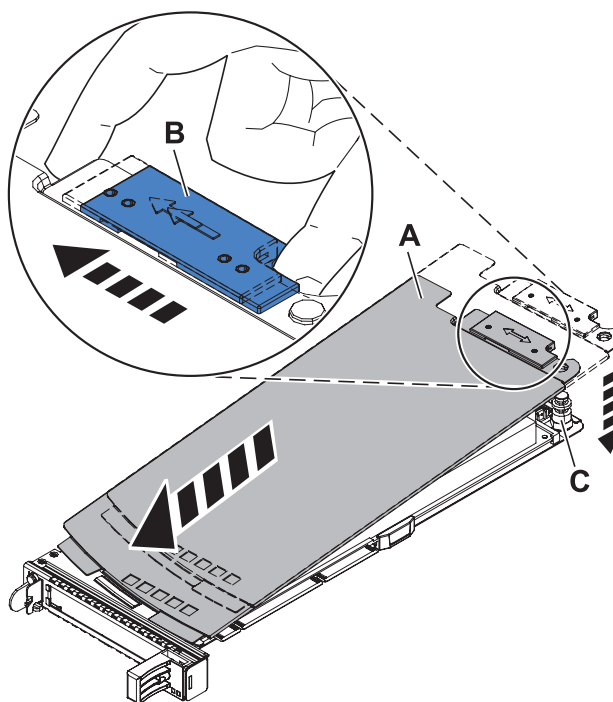
15. Install the short adapter

1. Remove the adapter stabilizer (**C**).
2. Place the hookarm (**D**) into the hole in the corner of the adapter. This supports the card when it is undocked from the connector on the system backplane.
3. Place and lock the retainers (**A**).
4. Ensure the adapter edge (**B**) is seated in each retainer groove.



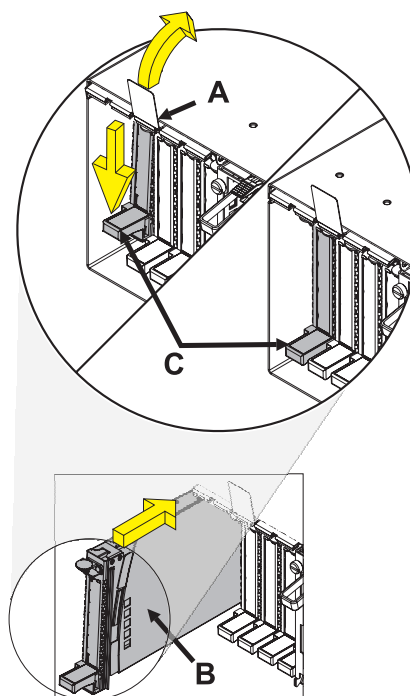
16. Replace the cassette cover

1. If servicing a double-wide cassette, screw pivot pin **(C)** into place.
2. Slide the cover **(A)** into position on the cassette.
3. While holding the cover latch **(B)** in the open position, place the cover over the pivot pin **(C)**.
4. Release the cover latch to lock the cover into place.



17. Install the cassette adapter

1. At the back of the system, identify the cassette slot you want to use.
2. Ensure the cassette handle is in the open position.
3. Lift and hold the PCI adapter EMC shield **(A)** in the open position.
4. Slide the cassette **(B)** into the cassette slot as shown.
5. When the cassette is fully inserted into the system, firmly press downward on the lower cassette handle **(C)**.
6. Lower the PCI adapter EMC shield into the closed position.



18. Close the back rack door

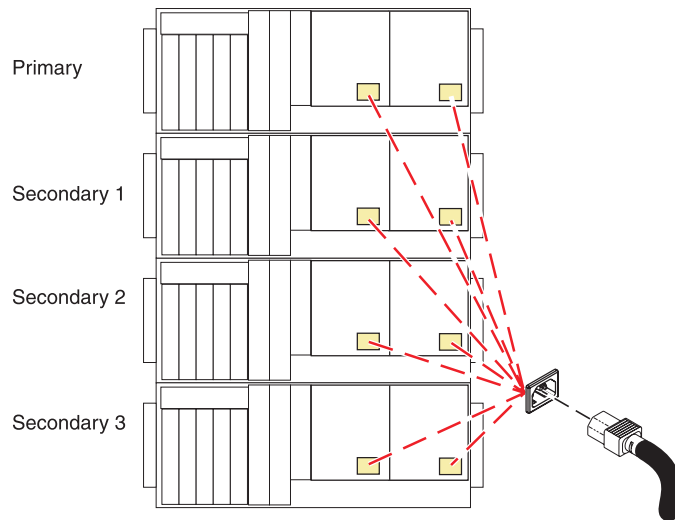
Close the back rack door.

19. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



20. Verify the repair

Go to Chapter 5, "Verifying a repair," on page 611.

If you are doing a concurrent repair using AIX, go to "Remove and replace a PCI adapter contained in a cassette in the system with the power on in AIX."

If you are doing a concurrent repair using Linux, go to "Remove and replace a PCI adapter contained in a cassette in the system with the power on in Linux" on page 492.

If you are doing a concurrent repair using i5/OS, go to "Remove and replace a PCI adapter contained in a cassette in the system with the power on in i5/OS" on page 506.

"Remove and replace a PCI adapter contained in a cassette in the system with the power on in AIX"

"Remove and replace a PCI adapter contained in a cassette in the system with the power on in Linux" on page 492

"Remove and replace a PCI adapter contained in a cassette in the system with the power on in i5/OS" on page 506

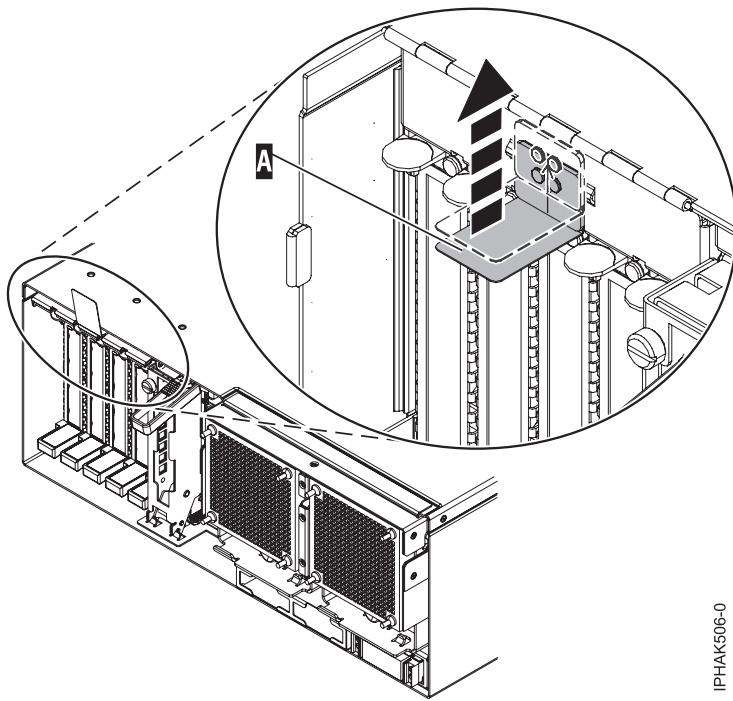
Remove and replace a PCI adapter contained in a cassette in the system with the power on in AIX

Procedures performed on a PCI adapter with the system power on in AIX, also known as hot-plug procedures, require the system administrator to take the PCI adapter offline prior to performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

To remove and replace an adapter, do the following steps:

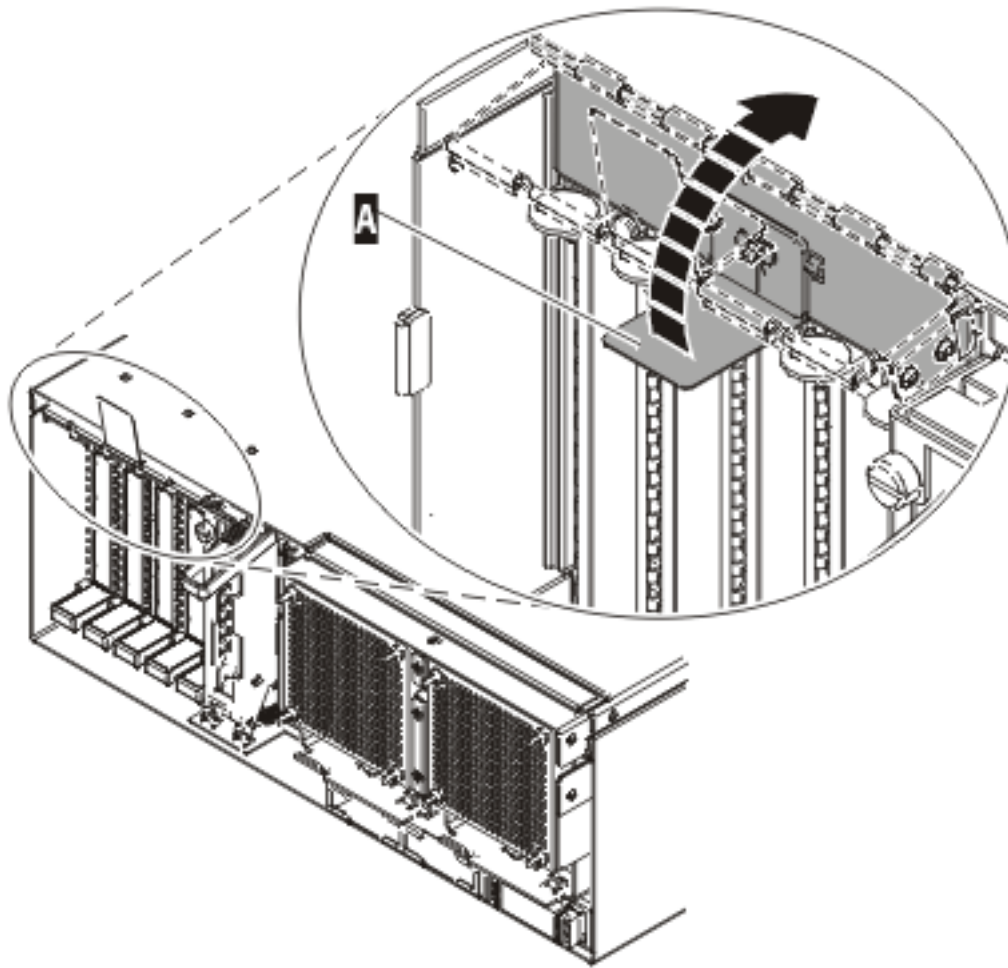
1. Determine the location of the PCI adapter in the system.

2. Record the slot number and location of each adapter being removed. Adapter slots are numbered on the rear of the system unit.
3. Ensure that any processes or applications that might use the adapter are stopped.
4. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at AIX command line.
5. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
6. At the FUNCTION SELECTION menu, select **Task Selection**, then press enter.
7. At the Task Selection list, select **PCI Hot Plug Manager**.
8. Select **Unconfigure a Device**, then press Enter.
9. Press F4 (or Esc +4) to display the **Device Names** menu.
10. Select the adapter you are removing in the **Device Names** menu.
11. Use the Tab key to answer YES to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter.
12. The **ARE YOU SURE** screen displays. Press Enter to verify the information. Successful unconfiguration is indicated by the OK message displayed next to the Command field at the top of the screen.
13. Press F3 (or Esc +3) twice to return to the **Hot Plug Manager** menu.
14. Select **replace/remove PCI Hot Plug adapter**.
15. Select the slot that has the device to be removed from the system.
16. Select **Replace**. Or, If you need to remove an adapter without replacing it, select **Remove**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.
17. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
18. Label, and then disconnect all cables attached to the adapter you plan to remove.
19. Lift up on the PCI adapter EMC shield **A** as shown in Figure 18 on page 480 and then rotate it up and away from the cassette as shown in Figure 19 on page 481.



IPHAK506-0

Figure 18. Lift up on the EMC shield



IPHAK507-0

Figure 19. Rotate the EMC shield into the open position

20. Remove the cassette. Lift up the lower cassette handle **B** as shown in the following figure. Pull the PCI cassette **C** out of the system.

Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.

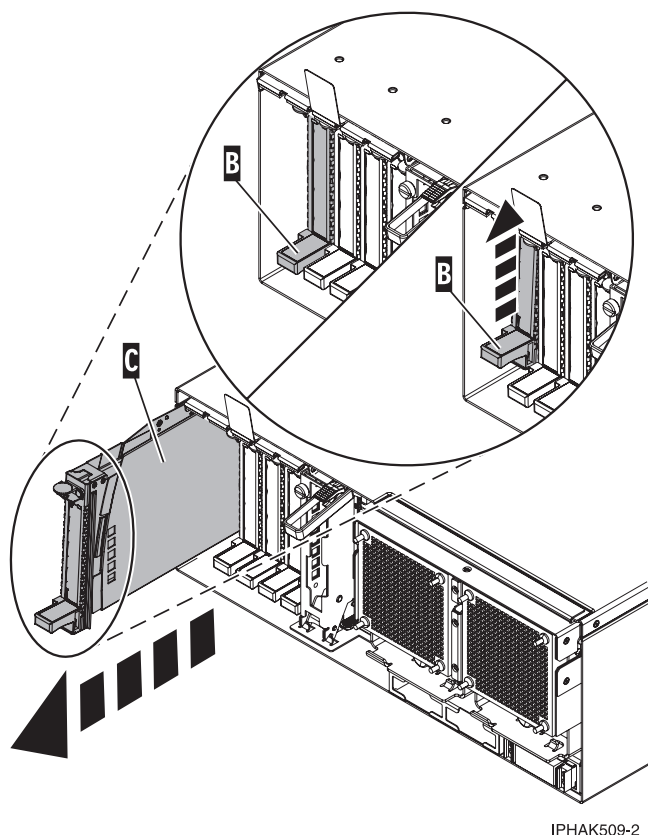
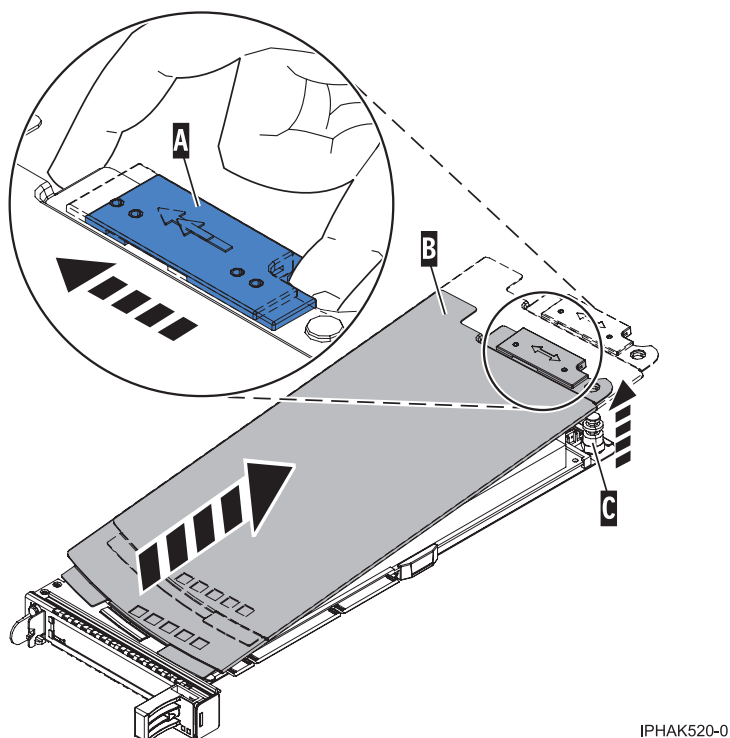


Figure 20. PCI adapter cassette removed from the system unit

21. Place the cassette with the cover facing up on an approved ESD surface. The cover will have a label on it.
22. Install the replacement adapter into the PCI adapter cassette using the following instructions. If the cassette is not going to contain a replacement adapter, use this same procedure to place an adapter filler panel in the cassette. Follow these steps:
 - a. Remove the cassette cover by doing the following steps:
 - 1) Slide the cover latch **A** to disengage it from the pivot pin **C** as shown in the following figure.
 - 2) Lift the cover **B** off of the pivot pin.
 - 3) Slide the cover off of the cassette.



IPHA520-0

Figure 21. PCI adapter cassette cover removed

b. Remove the adapter from the cassette by doing the following steps:

- 1) Unlock the adapter retainers by rotating the retainer clip **A** into the horizontal position. See Figure 22 on page 484.

Notes:

- The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
 - Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock.
 - When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.
 - If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.
- 2) Push the adapter retainers **B** away from the adapter.
 - 3) Unlock the adapter tailstock clamp **C**.
 - 4) Rotate the adapter out of the cassette by grasping the edge of the adapter opposite the tailstock, and then firmly rotate the adapter toward the bottom of the cassette.
 - 5) Lift the adapter out of the tailstock retaining channel.

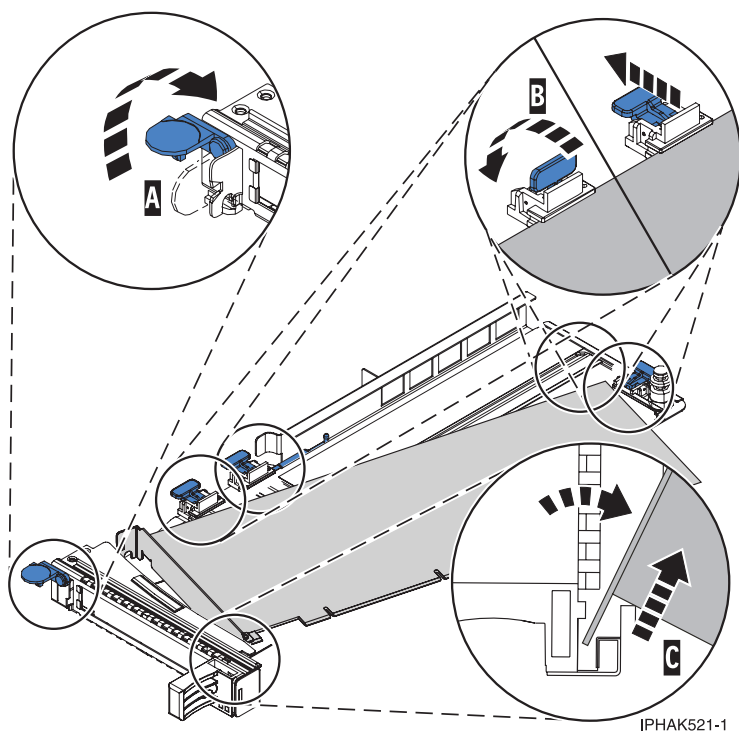
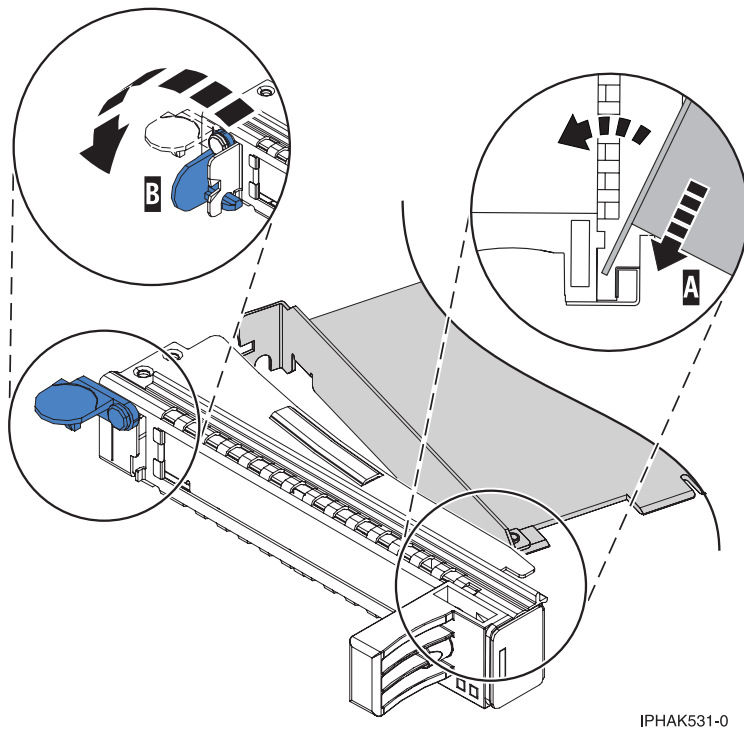


Figure 22. Adapter removed from the PCI adapter cassette

- c. Place the new adapter in the cassette.

Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling. If the cassette is not going to contain a PCI adapter, use this same procedure to place an adapter filler panel in the cassette.

- 1) Remove any shipping handles or brackets attached to the adapter.
- 2) With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **A**. See Figure 23 on page 485.
- 3) Rotate the adapter toward the top of the cassette and into place.
- 4) Close the tailstock clamp.



IPHAK531-0

Figure 23. Adapter removed from the PCI adapter single-width cassette

- 5) Position the adapter retainers to support the adapter, and then rotate the retainer clip **B** into the closed position. See Figure 23.

Note: Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock. When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter. Place the retainers on the adapter according to the length of the adapter being used. Select the appropriate instructions:

- Adapter-cassette retainer placement for large adapters
- Adapter-cassette retainer placement for mid-sized adapters
- Adapter-cassette retainer placement for small adapters

Adapter-cassette retainer placement for large adapters

- Place and lock the retainers **B**. See Figure 24 on page 486.

Attention: Use of the lower corner support retainer might interfere with the docking of the PCI card when positioned within the system. Ensure the retainer does not interfere with the adapter connectors on the system backplane.

- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

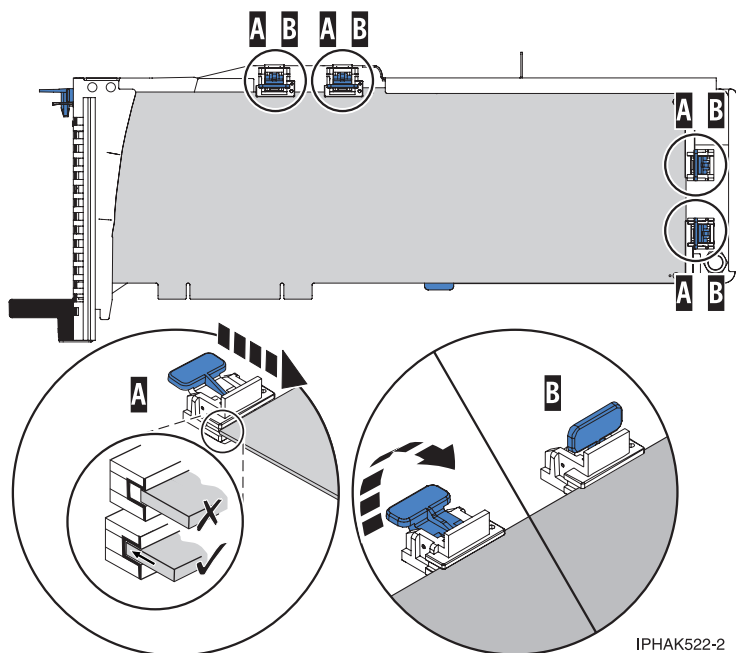


Figure 24. Long adapter in the PCI adapter cassette with the supports and stabilizer in place

Adapter-cassette retainer placement for mid-sized adapters

- Remove the adapter stabilizer **C**. See Figure 25 on page 487.
- Place and lock the retainers **B**.
- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

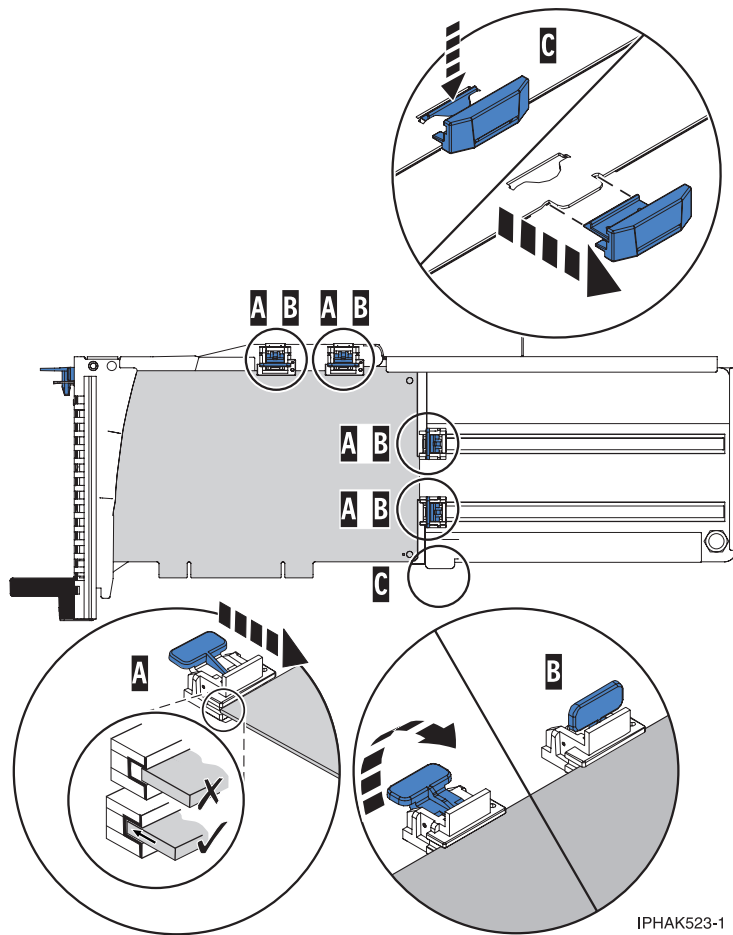


Figure 25. Medium-length adapter in the PCI adapter cassette with the supports in place

Adapter-cassette retainer placement for small adapters

- Remove the adapter stabilizer **C**. See Figure 26 on page 488.
- Place the hookarm **D** into the hole in the corner of the adapter. This supports the card when it is undocked from the connector on the system backplane.
- Place and lock the retainers **B**.
- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

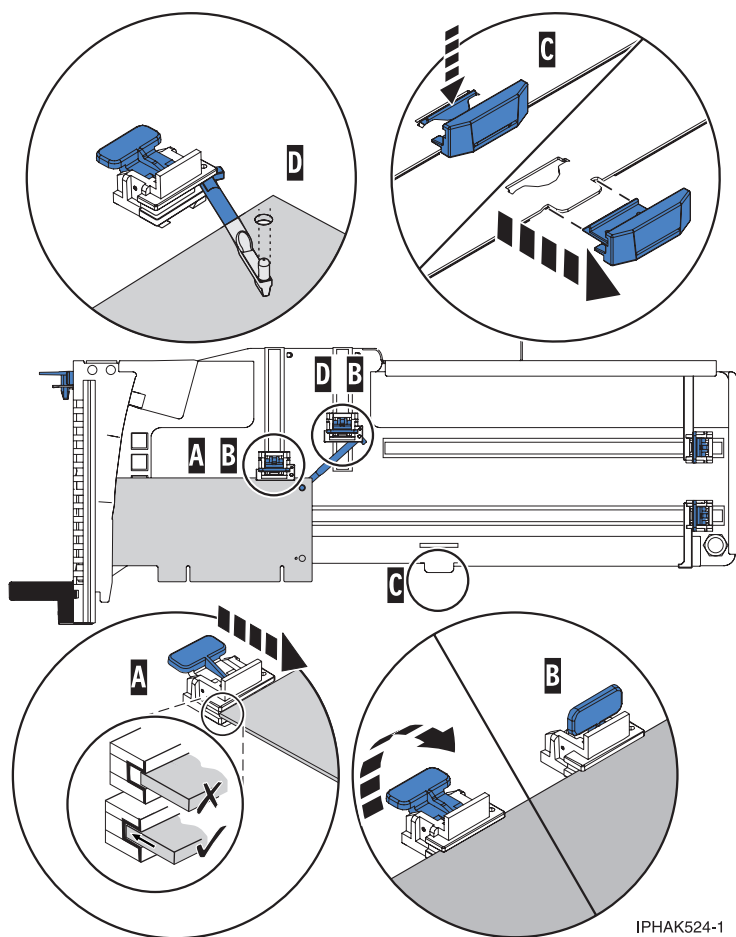
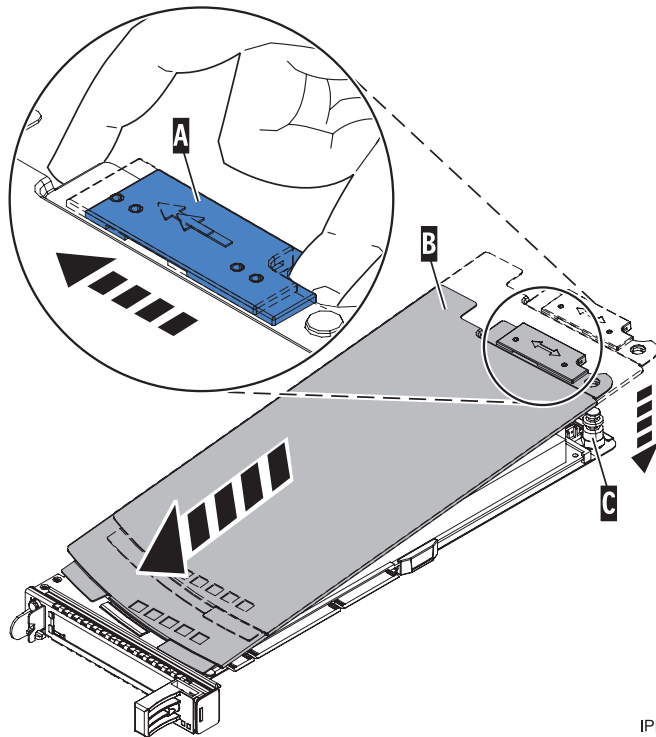


Figure 26. Short adapter in the PCI adapter cassette with the supports and the hookarm in place

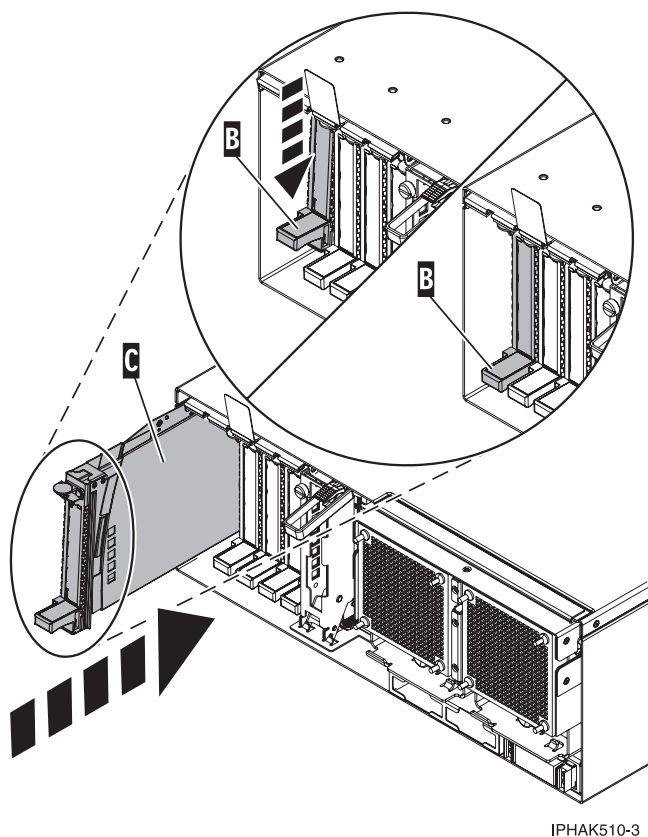
- d. Replace the cassette cover by doing the following steps:
 - 1) Slide the cover **B** into position on the cassette.
 - 2) While holding the cover latch **A** in the open position, place the cover over the pivot pin **C**.
 - 3) Release the cover latch to lock the cover into place.



IPHA530-0

Figure 27. PCI adapter cassette cover replaced

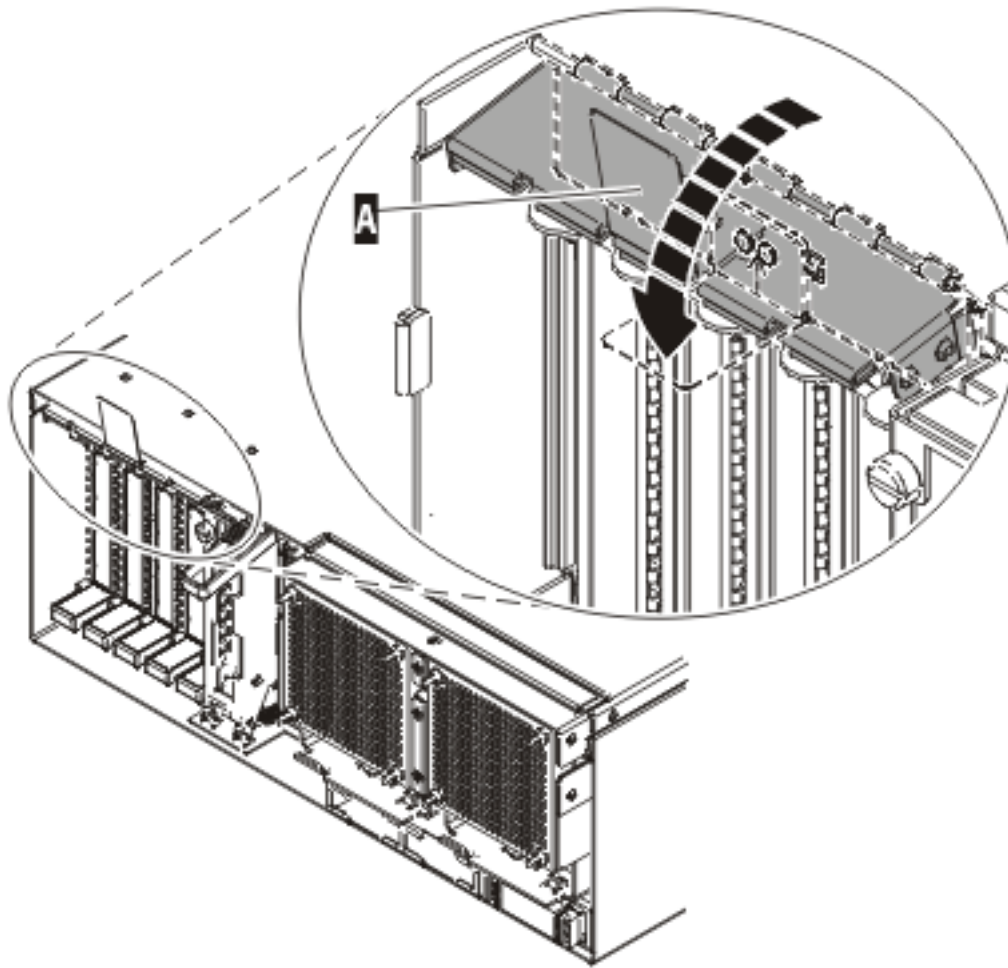
23. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
24. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be docked in the system.
25. Lift and hold the PCI adapter EMC shield in the open position. See Figure 18 on page 480 and Figure 19 on page 481.
26. Slide the cassette **C** into the cassette slot as shown in the following figure.
27. When the cassette is fully inserted into the system, firmly press downward on the lower cassette handle **B** to lock the adapter in its connector.



IPHAK510-3

Figure 28. PCI adapter cassette removed from the system unit

28. Connect the adapter cables.
29. Lower the PCI adapter EMC shield **A** into the closed position, close the shield latch, then close the rear rack door.



IP HAK508-0

Figure 29. PCI adapter EMC shield in the closed position

30. Return to the AIX screen. Choose one of the following options:
 - If you are replacing an adapter, go to step 31.
 - If you removing an adapter without replacing it, follow these steps:
 - a. Press enter and continue to follow the screen instructions until you receive a message that the removal is successful. Successful removal is indicated by the OK message displayed next to the **Command** field at the top of the screen.
 - b. Press F10 to exit the Hot-Plug Manager.
 - c. Run the **diag -a** command. If the system responds with a menu or prompt, follow the instructions to complete the configuration.
 - d. Continue at step 40 on page 492.
31. Press enter and continue to follow the screen instructions until you receive a message that the replacement is successful. Successful replacement is indicated by the OK message displayed next to the **Command** field at the top of the screen.
32. Press the F3 (or Esc+3) key to return to the **PCI Hot-Plug Manager** menu.
33. Press the F3 (or Esc+3) key to return to the **TASK** selection list.
34. Select **Log Repair Action**.
35. Select the resource just replaced, press Enter, press Commit (F7 or ESC 7), then press Enter.
36. Press F3 (or Esc+3) to return to **TASK Selection List**.

37. Select **Hot Plug Task**, press enter.
38. Select **PCI Hot Plug Manager**, then select **Configure a defined device**, then press Enter.
39. Select the device just replaced from the list, then press Enter. The device is now configured.
40. Press the F10 key to exit the diagnostic program.

Remove and replace a PCI adapter contained in a cassette in the system with the power on in Linux

Procedures performed on a PCI adapter with the system power on in Linux, also known as hot-plug procedures, require the system administrator to take the PCI adapter offline prior to performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

Before performing this procedure, do the following:

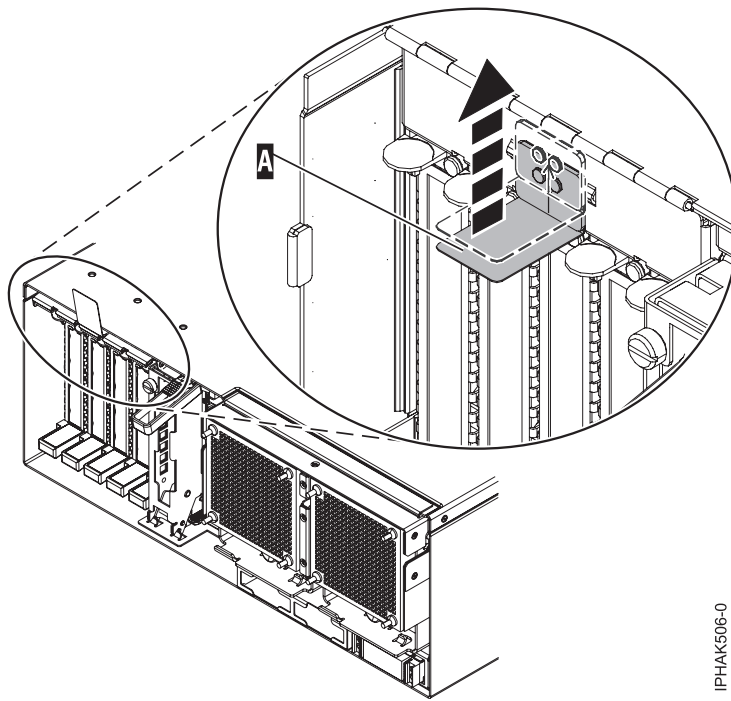
- Ensure that the system meets the “Prerequisites for hot-plugging PCI adapters in Linux” on page 504
- “Verify that the Linux, hot-plug PCI tools are installed” on page 505.

To remove and replace an adapter, do the following steps:

1. Determine the location of the PCI adapter in the system.
2. Record the slot number and location of each adapter being removed. Adapter slots are numbered on the rear of the system unit.
3. Ensure that any processes or applications that might use the adapter are stopped.
4. Run the `drs1ot_chrp_pci` command to enable an adapter to be replaced:
For example, to replace the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:

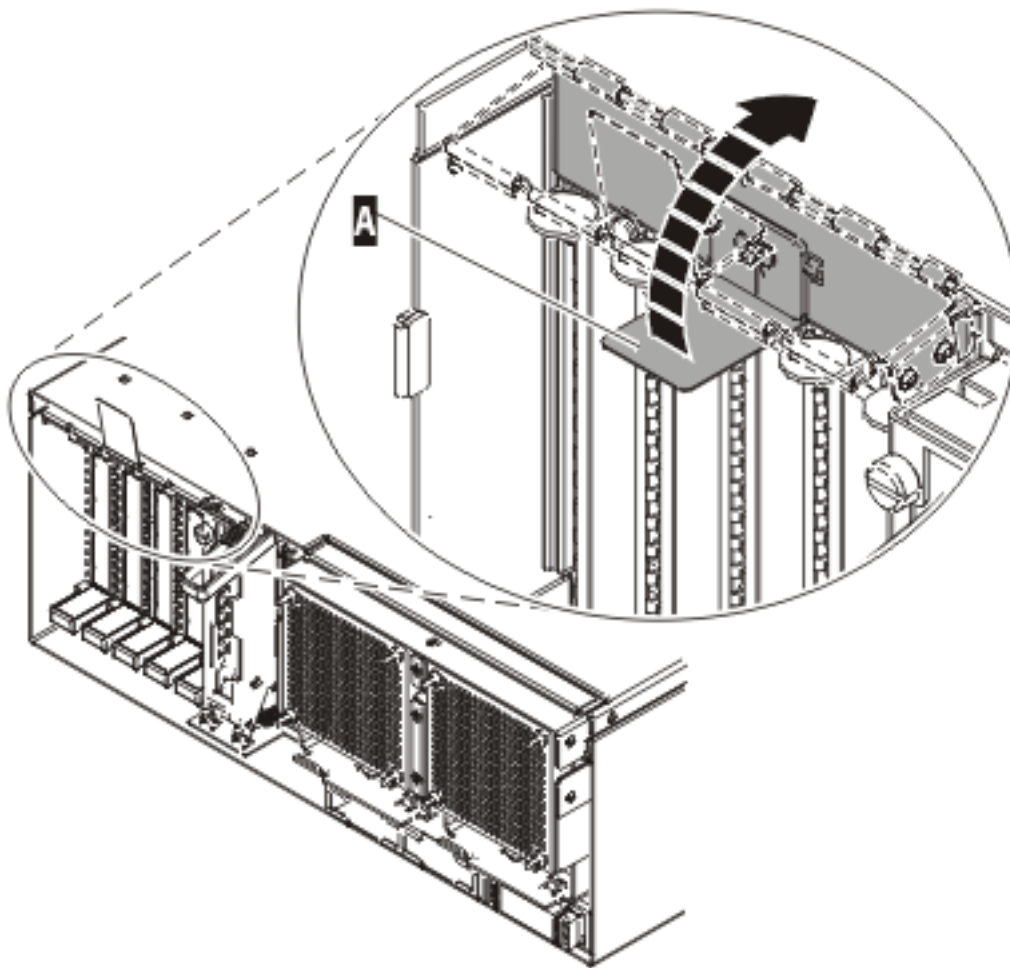
```
drs1ot_chrp_pci -R -s U7879.001.DQD014E-P1-C3
```


Follow the instructions on the display to complete the task.
5. Label, and then disconnect all cables attached to the adapter you plan to remove.
6. Lift up on the PCI adapter EMC shield **A** as shown in Figure 30 on page 493 and then rotate it up and away from the cassette as shown in Figure 31 on page 494.



IPHAK506-0

Figure 30. Lift up on the EMC shield

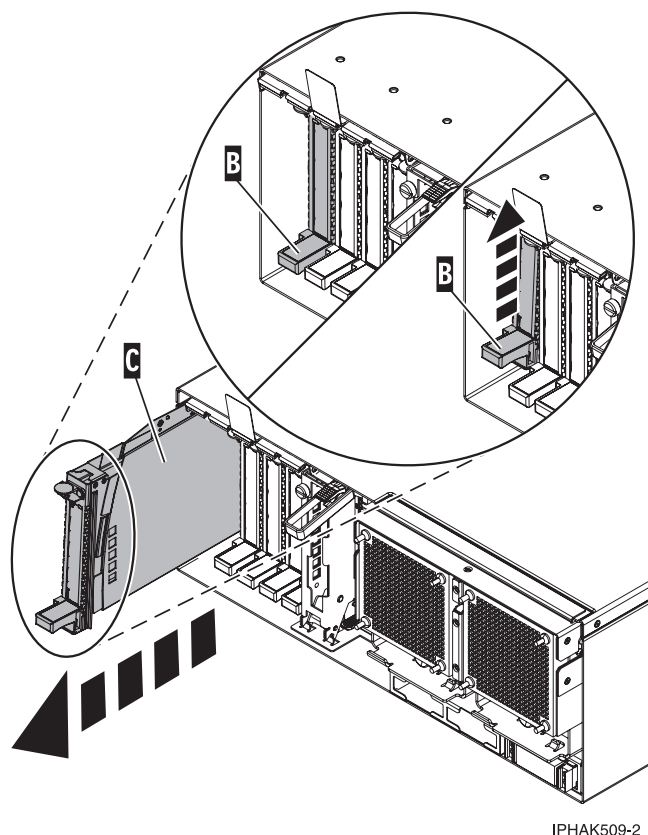


IPHAK507-0

Figure 31. Rotate the EMC shield into the open position

7. Remove the cassette. Lift up the lower cassette handle **B** as shown in the following figure. Pull the PCI cassette **C** out of the system.

Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.



IPHAK509-2

Figure 32. PCI adapter cassette removed from the system unit

8. Place the cassette with the cover facing up on an approved ESD surface. The cover will have a label on it.
9. Install the replacement adapter into the PCI adapter cassette using the following instructions. If the cassette is not going to contain a replacement adapter, use this same procedure to place an adapter filler panel in the cassette. Follow these steps:
 - a. Remove the cassette cover by doing the following steps:
 - 1) Slide the cover latch **A** to disengage it from the pivot pin **C** as shown in the following figure.
 - 2) Lift the cover **B** off of the pivot pin.
 - 3) Slide the cover off of the cassette.

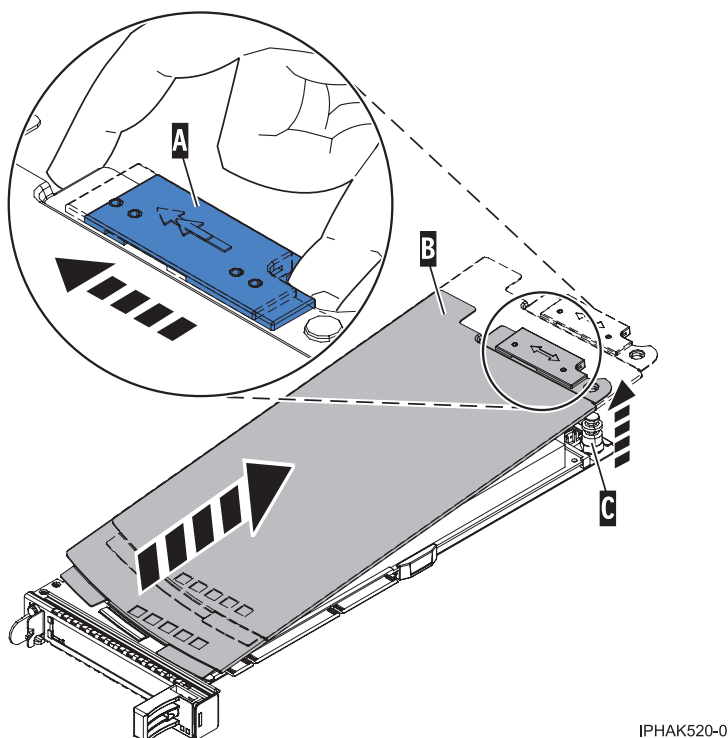


Figure 33. PCI adapter cassette cover removed

b. Remove the adapter from the cassette by doing the following steps:

- 1) Unlock the adapter retainers by rotating the retainer clip **A** into the horizontal position. See Figure 34 on page 497.

Notes:

- The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
 - Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock.
 - When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.
 - If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.
- 2) Push the adapter retainers **B** away from the adapter.
 - 3) Unlock the adapter tailstock clamp **C**.
 - 4) Rotate the adapter out of the cassette by grasping the edge of the adapter opposite the tailstock, and then firmly rotate the adapter toward the bottom of the cassette.
 - 5) Lift the adapter out of the tailstock retaining channel.

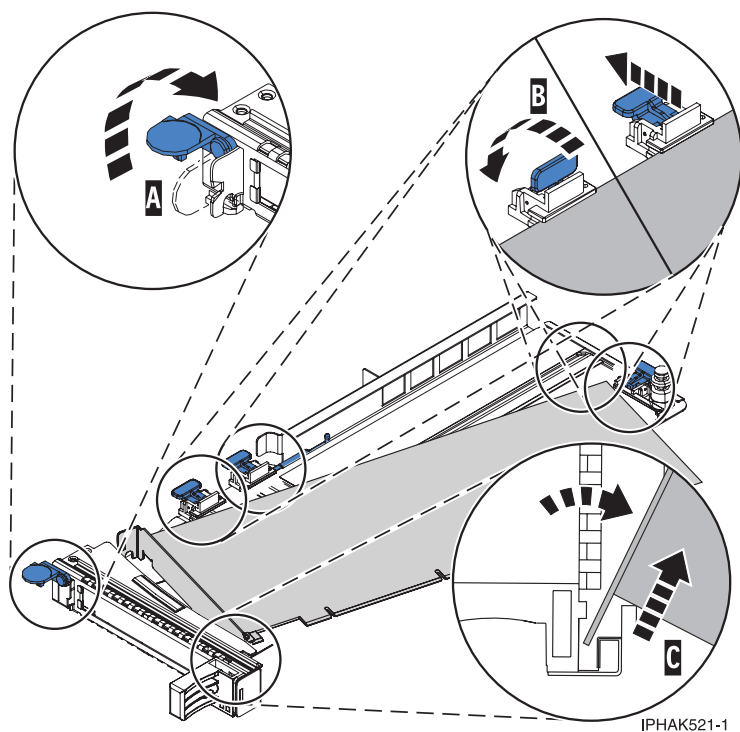
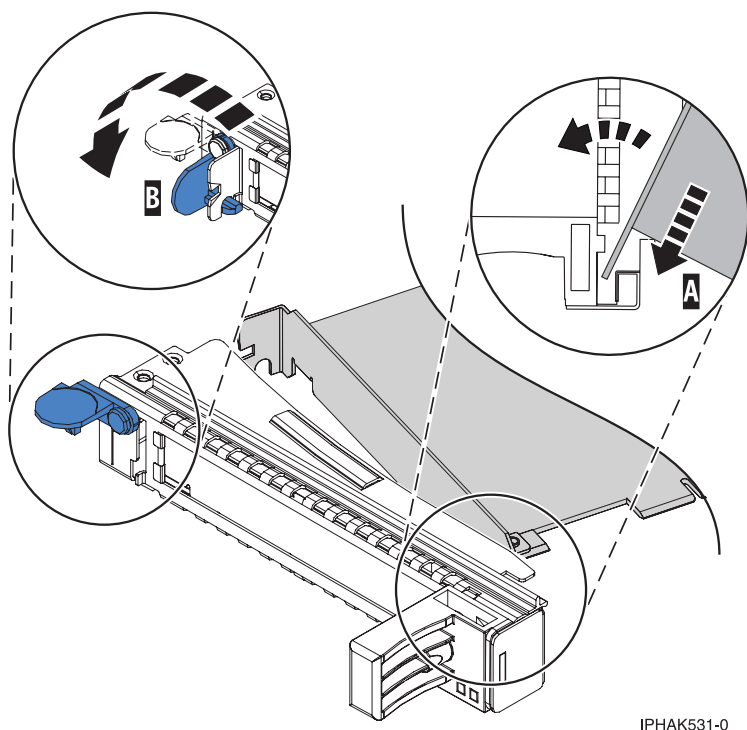


Figure 34. Adapter removed from the PCI adapter cassette

- c. Place the new adapter in the cassette.

Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling. If the cassette is not going to contain a PCI adapter, use this same procedure to place an adapter filler panel in the cassette.

- 1) Remove any shipping handles or brackets attached to the adapter.
- 2) With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **A**. See Figure 35 on page 498.
- 3) Rotate the adapter toward the top of the cassette and into place.
- 4) Close the tailstock clamp.



IPHAK531-0

Figure 35. Adapter removed from the PCI adapter single-width cassette

- 5) Position the adapter retainers to support the adapter, and then rotate the retainer clip **B** into the closed position. See Figure 35.

Note: Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock. When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter. Place the retainers on the adapter according to the length of the adapter being used. Select the appropriate instructions:

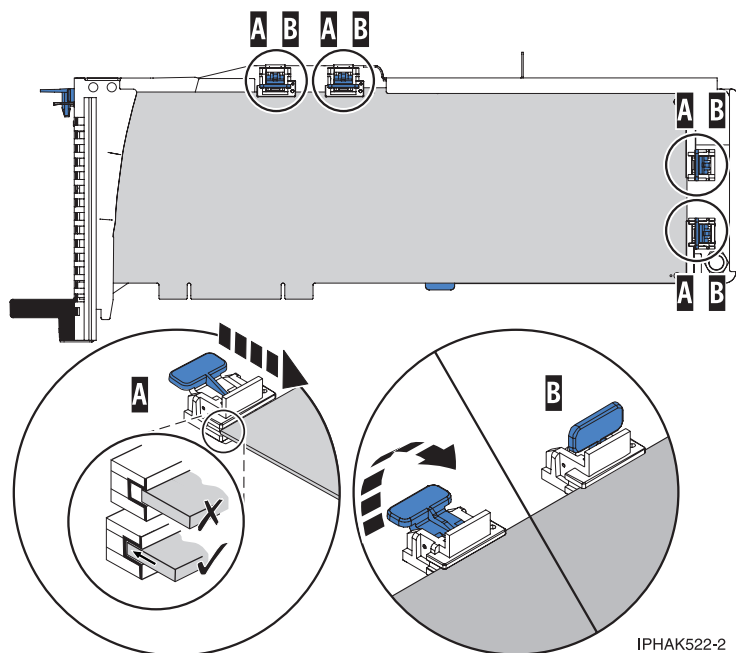
- Adapter-cassette retainer placement for large adapters
- Adapter-cassette retainer placement for mid-sized adapters
- Adapter-cassette retainer placement for small adapters

Adapter-cassette retainer placement for large adapters

- Place and lock the retainers **B**. See Figure 36 on page 499.

Attention: Use of the lower corner support retainer might interfere with the docking of the PCI card when positioned within the system. Ensure the retainer does not interfere with the adapter connectors on the system backplane.

- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

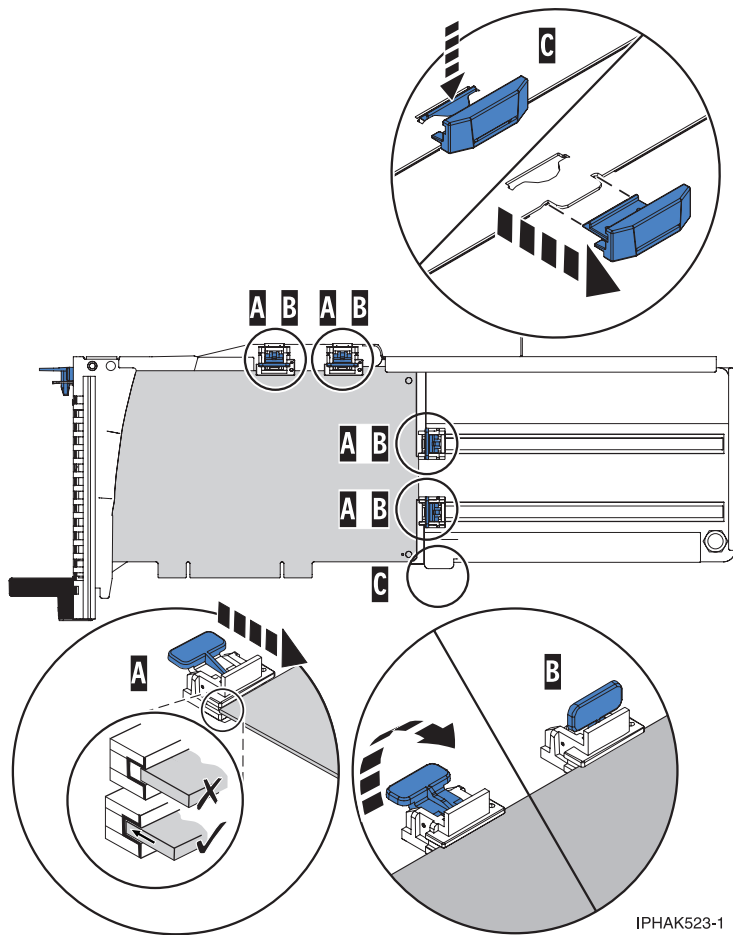


IPHA522-2

Figure 36. Long adapter in the PCI adapter cassette with the supports and stabilizer in place

Adapter-cassette retainer placement for mid-sized adapters

- Remove the adapter stabilizer **C**. See Figure 37 on page 500.
- Place and lock the retainers **B**.
- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.



IPHA523-1

Figure 37. Medium-length adapter in the PCI adapter cassette with the supports in place

Adapter-cassette retainer placement for small adapters

- Remove the adapter stabilizer **C**. See Figure 38 on page 501.
- Place the hookarm **D** into the hole in the corner of the adapter. This supports the card when it is undocked from the connector on the system backplane.
- Place and lock the retainers **B**.
- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

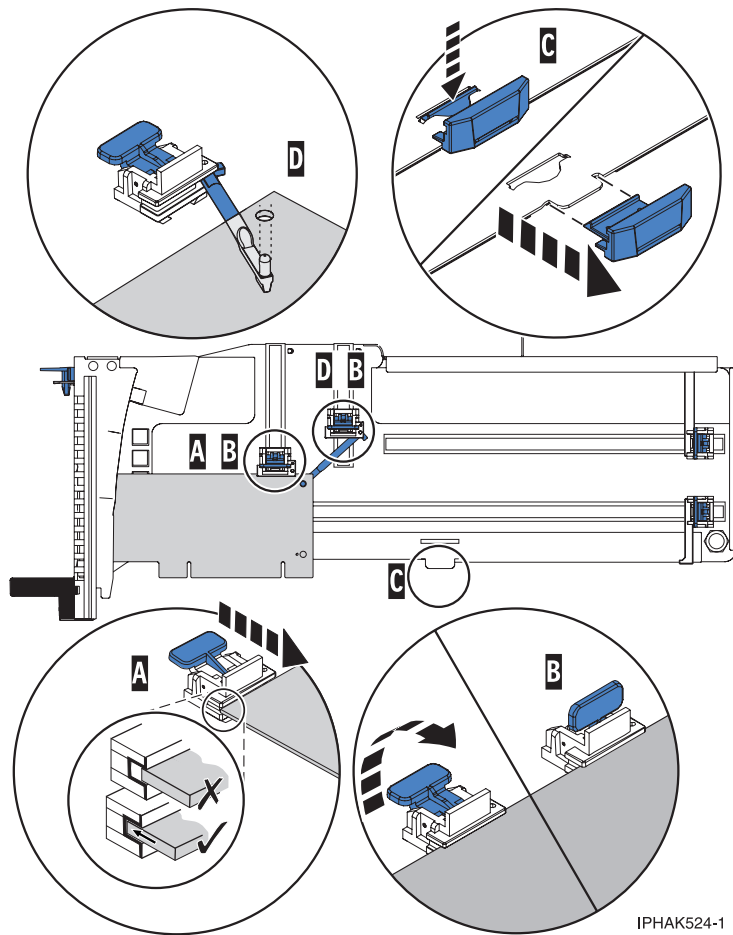
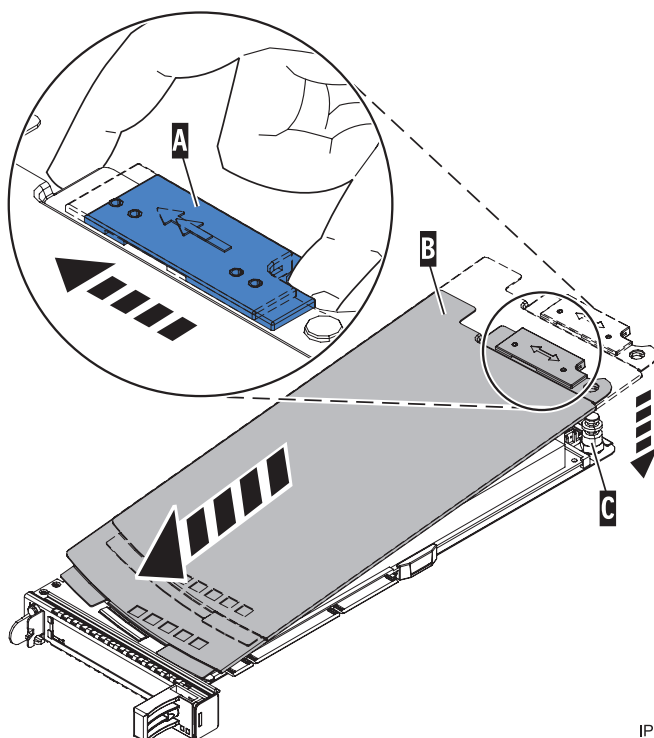


Figure 38. Short adapter in the PCI adapter cassette with the supports and the hookarm in place

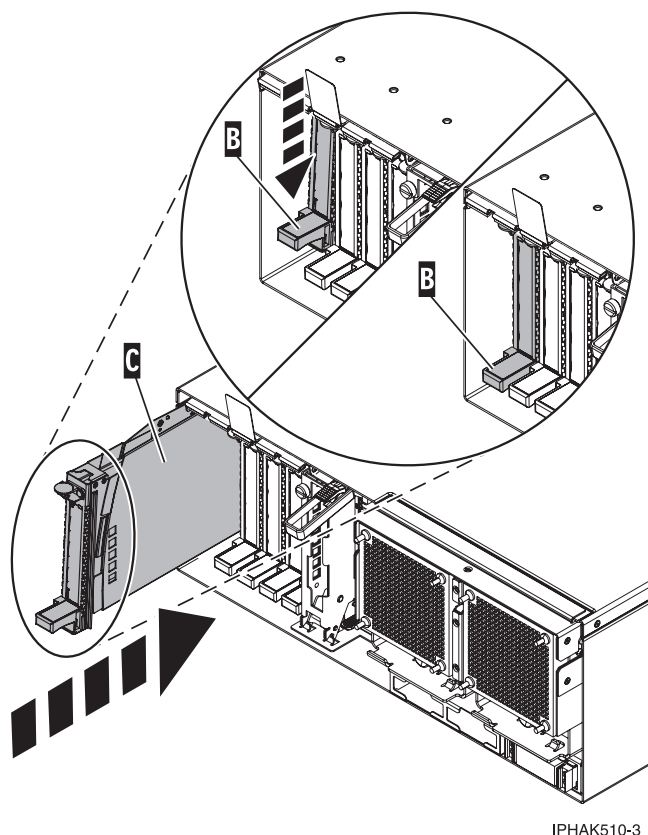
- d. Replace the cassette cover by doing the following steps:
 - 1) Slide the cover **B** into position on the cassette.
 - 2) While holding the cover latch **A** in the open position, place the cover over the pivot pin **C**.
 - 3) Release the cover latch to lock the cover into place.



IPHA530-0

Figure 39. PCI adapter cassette cover replaced

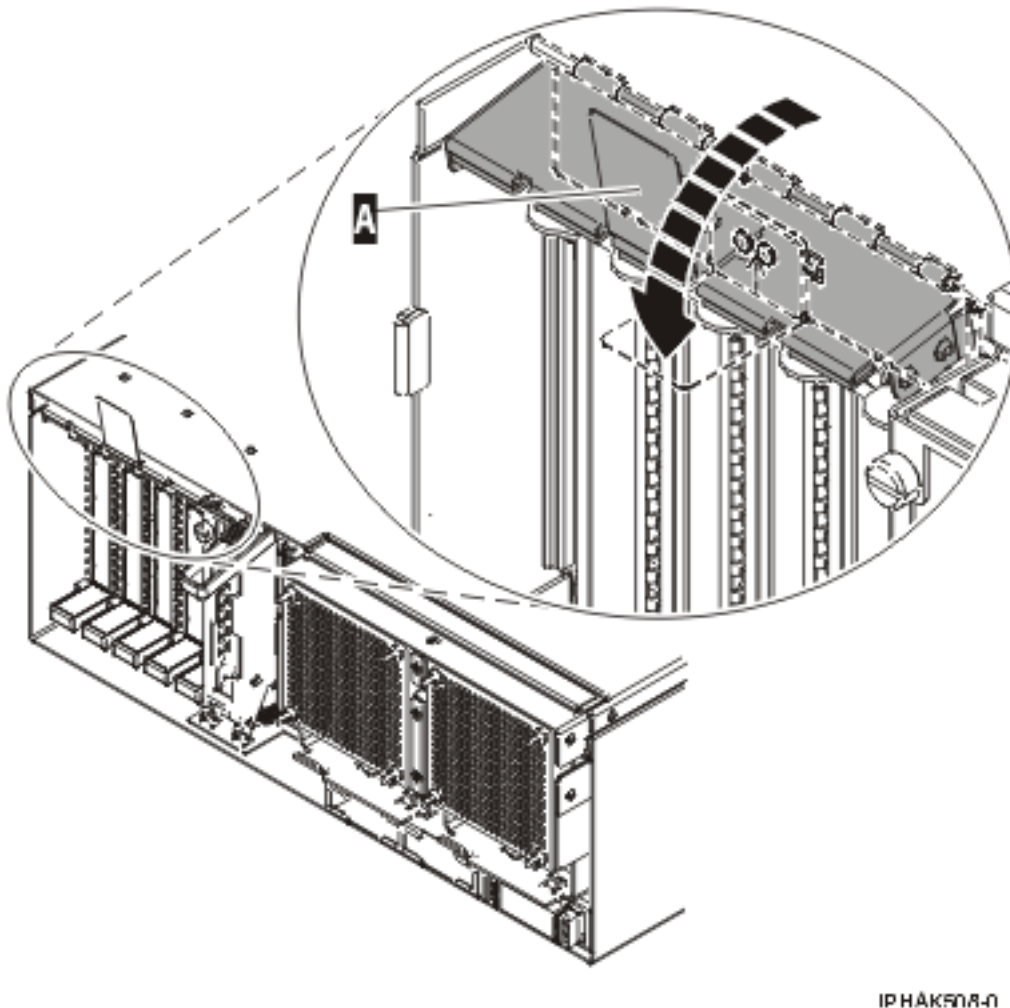
10. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
11. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be docked in the system.
12. Lift and hold the PCI adapter EMC shield in the open position. See Figure 30 on page 493 and Figure 31 on page 494.
13. Slide the cassette **C** into the cassette slot as shown in the following figure.
14. When the cassette is fully inserted into the system, firmly press downward on the lower cassette handle **B** to lock the adapter in its connector.



IPHAK510-3

Figure 40. PCI adapter cassette removed from the system unit

15. Connect the adapter cables.
16. Lower the PCI adapter EMC shield **A** into the closed position, close the shield latch, then close the rear rack door.



IP HAK508-0

Figure 41. PCI adapter EMC shield in the closed position

17. Run the `lsslot` command to verify that the slot is occupied.

For example, Enter `lsslot -c pci -s U7879.001.DQD014E-P1-C3`

The following is an example of the information displayed by this command:

```
# Slot      Description      Device(s) U7879.001.DQD014E-P1-C3 PCI-X capable,
64 bit, 133MHz slot 0001:40:01.0
```

“Prerequisites for hot-plugging PCI adapters in Linux”

In the course of installing, removing, or replacing a PCI adapter with the system power on in Linux you might need complete some prerequisite tasks. Use the information in this section to identify those prerequisites.

“Verify that the Linux, hot-plug PCI tools are installed” on page 505

In the course of installing, removing, or replacing a PCI adapter with the system power on in Linux you might need use the hot-plug PCI tools. Use the procedure in this section to verify that you have the hot-plug PCI tools installed.

Prerequisites for hot-plugging PCI adapters in Linux

In the course of installing, removing, or replacing a PCI adapter with the system power on in Linux you might need complete some prerequisite tasks. Use the information in this section to identify those prerequisites.

The Linux, system administrator needs to take the PCI adapter offline prior to removing, replacing, or installing a PCI adapter with the system power on (hot-plugging). Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

Before hot-plugging adapters for storage devices, ensure file systems on those devices are unmounted. After hot-plugging adapters for storage devices, ensure the file systems on those devices are remounted.

Before hot-plugging an adapter, ensure that the server or partition is at the correct level of the Linux operating system (Linux 2.6 or later).

Install the POWER™ Linux Service Aids. These service aids enable system serviceability, as well to improve system management.

If you are using a Linux on POWER distribution with Linux kernel version 2.6 or greater, you can install the Service Aids that gives you access to more capabilities, which can help you diagnose problems on your system.

This software is available at the Service and productivity tools for Linux on POWER Web site. (<http://techsupport.services.ibm.com/server/lopdiags>)

Verify that the Linux, hot-plug PCI tools are installed

In the course of installing, removing, or replacing a PCI adapter with the system power on in Linux you might need use the hot-plug PCI tools. Use the procedure in this section to verify that you have the hot-plug PCI tools installed.

1. Enter the following command to verify that the hot-plug PCI tools are installed:

```
rpm -aq | grep rpa-pci-hotplug
```

If the command does not list any rpa-pci-hotplug packages, the PCI Hot Plug tools are not installed.

2. Enter the following command to ensure that the rpaphp driver is loaded:

```
ls -l /sys/bus/pci/slots/
```

The directory should contain data. If the directory is empty, the driver is not loaded or the system does not contain hot-plug PCI slots. The following is an example of the information displayed by this command:

```
drwxr-xr-x 15 root root 0 Feb 16 23:31 .
drwxr-xr-x  5 root root 0 Feb 16 23:31 ..
drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.0
drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.2
drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.4
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.0
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.2
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.4
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.6
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.0
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.2
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.4
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.6
```

If the directory does not exist, run the following command to mount the filesystem:

```
mount -t sysfs sysfs /sys
```

3. Ensure the following tools are available in the /usr/sbin directory.
 - lsslot
 - drslot_chrp_pci
4. Return to the procedure that sent you here.

Remove and replace a PCI adapter contained in a cassette in the system with the power on in i5/OS

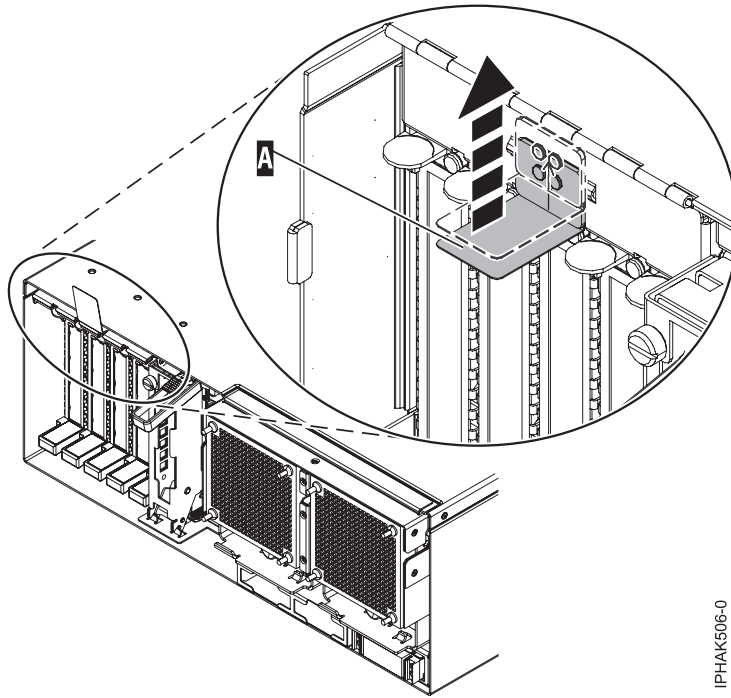
Procedures performed on a PCI adapter with the system power on in i5/OS, also known as hot-plug procedures, require the system administrator to take the PCI adapter offline prior to performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

To remove and replace an adapter, do the following steps:

1. Determine the location of the PCI adapter in the system.
2. Record the slot number and location of each adapter being removed. Adapter slots are numbered either below or along the side of each adapter slot.
3. Ensure that any processes or applications that might use the adapter are stopped.
4. Go to your terminal and type **strsst** on the command line of the Main Menu and press Enter.
5. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.
6. Select **Start a service tool** from the System Service Tools (SST) display. Press Enter.
7. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
8. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
9. Type **9** (Hardware contained within package) in the System Unit or Expansion Unit field of the unit where you are removing the card, then press Enter.
10. Select the option to **Include empty positions**.
11. Select **Concurrent Maintenance** on the card position where you want to remove the card and then press Enter.
12. Select the option to **Toggle LED blink off/on**. A light-emitting diode (LED) located on your system or I/O enclosure blinks identifying the PCI adapter position you chose. Physically verify that this is the slot where you want to remove the adapter.
13. Select the option to **Toggle LED blink off/on** to stop the blinking LED.
14. Select the option to **Power off domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
15. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message: Power off complete
16. Label, and then disconnect all cables attached to the adapter you plan to remove.
17. Record the slot number and location of each adapter being removed.

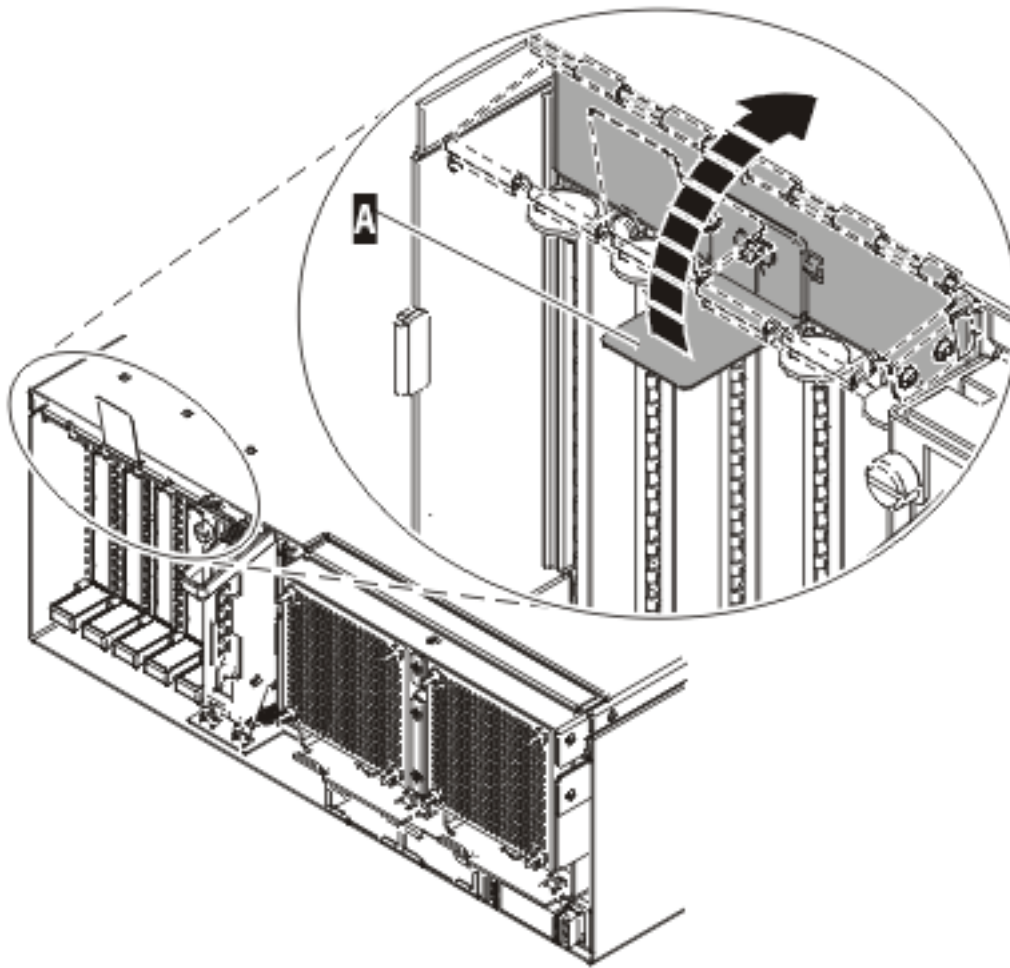
Note: Adapter slots are numbered below or along side of each PCI adapter slot.

18. Lift up on the PCI adapter EMC shield **A** as shown in Figure 42 on page 507, and then rotate it up and away from the cassette as shown in Figure 43 on page 508.



IPHAK506-0

Figure 42. Lift up on the EMC shield

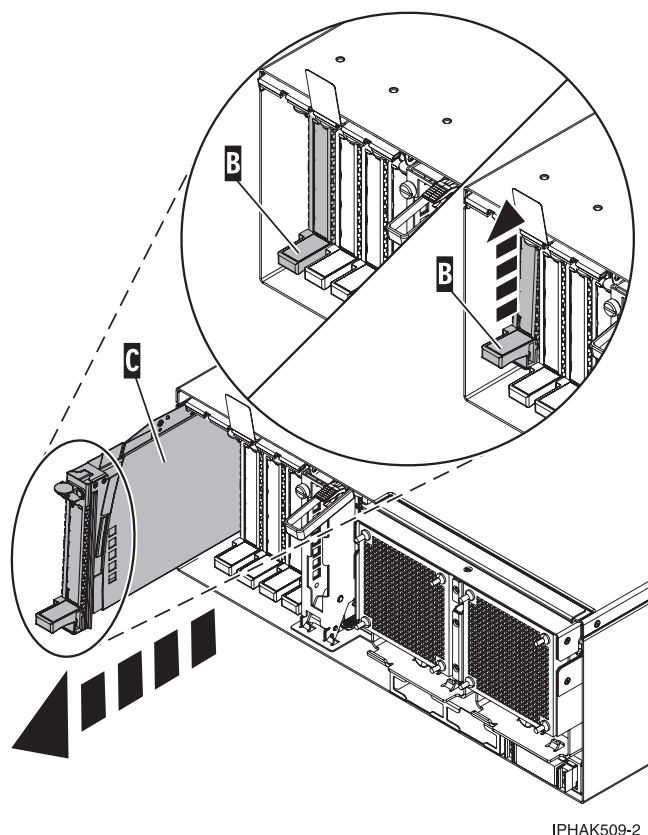


IPHAK507-0

Figure 43. Rotate the EMC shield into the open position

19. Remove the cassette. Lift up the lower cassette handle **B** as shown in the following figure. Pull the PCI cassette **C** out of the system.

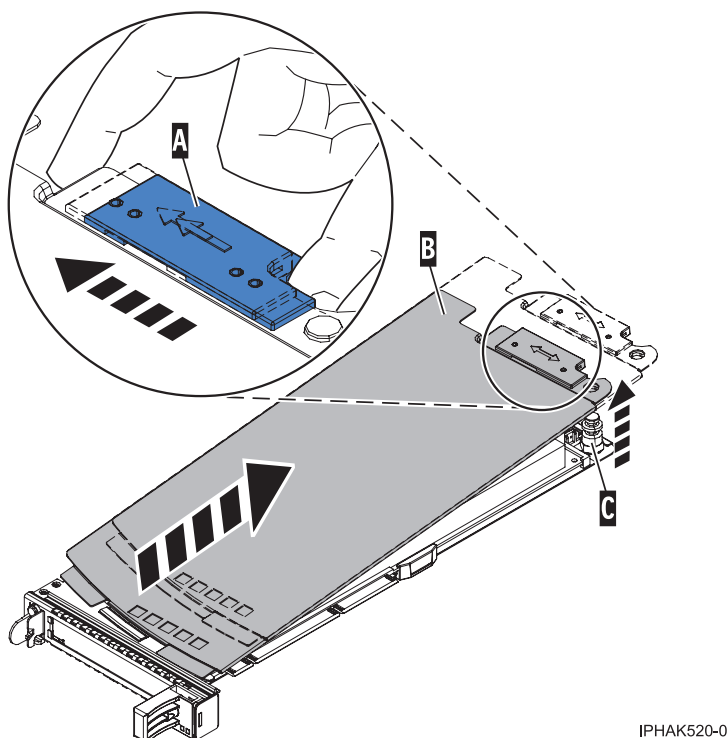
Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.



IPHAK509-2

Figure 44. PCI adapter cassette removed from the system unit

20. Place the cassette with the cover facing up on an approved ESD surface. The cover will have a label on it.
21. Install the replacement adapter into the PCI adapter cassette using the following instructions. If the cassette is not going to contain a replacement adapter, use this same procedure to place an adapter filler panel in the cassette. Follow these steps:
 - a. Remove the cassette cover by doing the following steps:
 - 1) Slide the cover latch **A** to disengage it from the pivot pin **C** as shown in the following figure.
 - 2) Lift the cover **B** off of the pivot pin.
 - 3) Slide the cover off of the cassette.



IPHA520-0

Figure 45. PCI adapter cassette cover removed

b. Remove the adapter from the cassette by doing the following steps:

- 1) Unlock the adapter retainers by rotating the retainer clip **A** into the horizontal position. See Figure 46 on page 511.

Notes:

- The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
 - Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock.
 - When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.
 - If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.
- 2) Push the adapter retainers **B** away from the adapter.
 - 3) Unlock the adapter tailstock clamp **C**.
 - 4) Rotate the adapter out of the cassette by grasping the edge of the adapter opposite the tailstock, and then firmly rotate the adapter toward the bottom of the cassette.
 - 5) Lift the adapter out of the tailstock retaining channel.

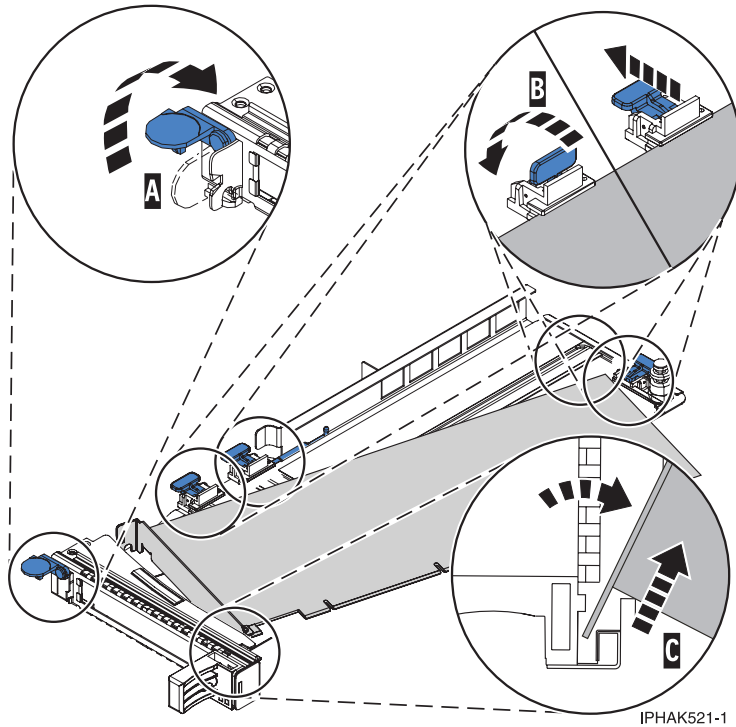
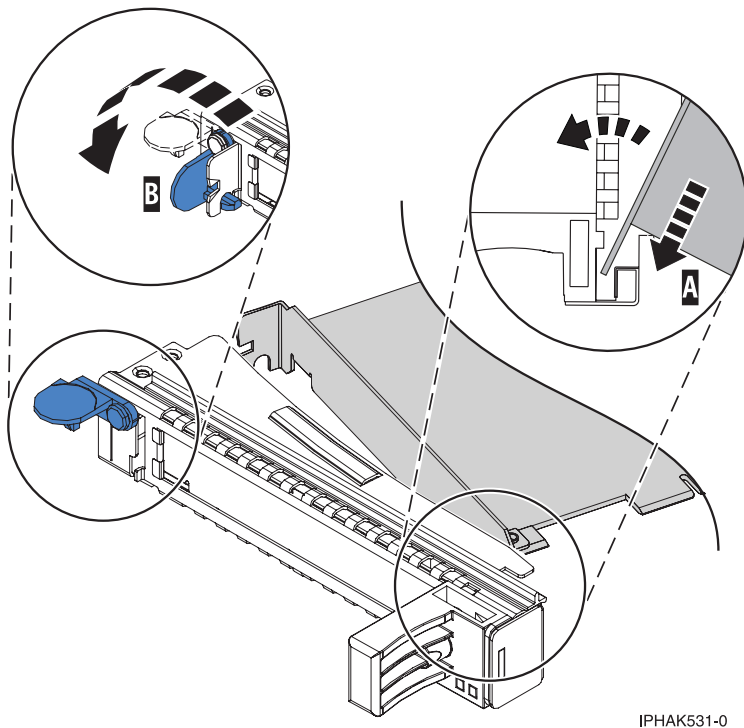


Figure 46. Adapter removed from the PCI adapter cassette

- c. Place the new adapter in the cassette.

Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling. If the cassette is not going to contain a PCI adapter, use this same procedure to place an adapter filler panel in the cassette.

- 1) Remove any shipping handles or brackets attached to the adapter.
- 2) With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **A**. See Figure 47 on page 512.
- 3) Rotate the adapter toward the top of the cassette and into place.
- 4) Close the tailstock clamp.



IPHAK531-0

Figure 47. Adapter removed from the PCI adapter single-width cassette

- 5) Position the adapter retainers to support the adapter, and then rotate the retainer clip **B** into the closed position. See Figure 47

Note: Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock. When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter. Place the retainers on the adapter according to the length of the adapter being used. Select the appropriate instructions:

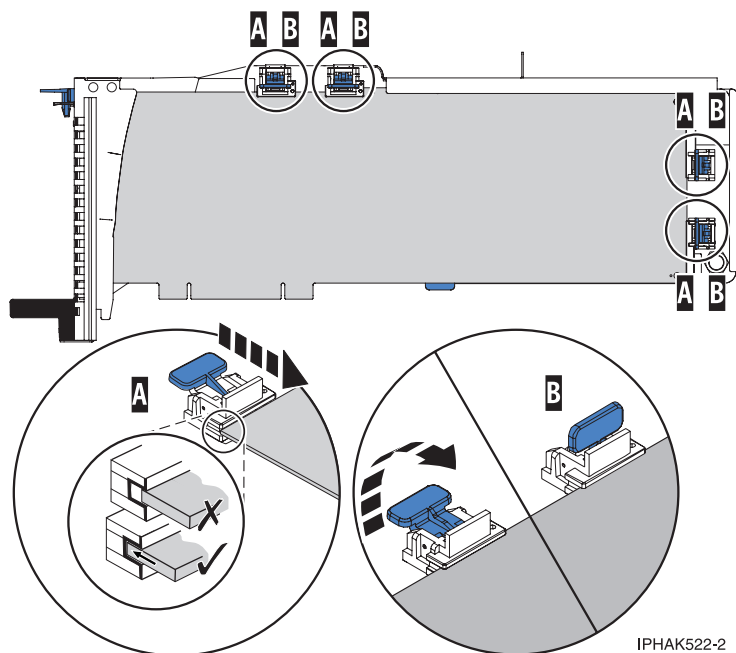
- Adapter-cassette retainer placement for large adapters
- Adapter-cassette retainer placement for mid-sized adapters
- Adapter-cassette retainer placement for small adapters

Adapter-cassette retainer placement for large adapters

- Place and lock the retainers **B**. See Figure 48 on page 513.

Attention: Use of the lower corner support retainer might interfere with the docking of the PCI card when positioned within the system. Ensure the retainer does not interfere with the adapter connectors on the system backplane.

- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

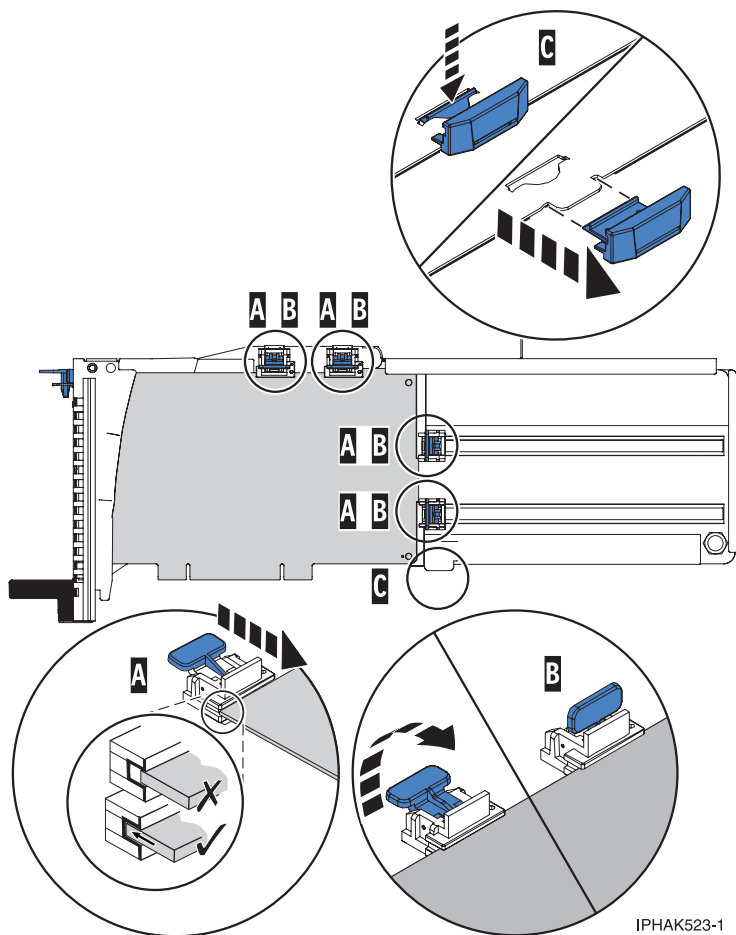


IPHA522-2

Figure 48. Long adapter in the PCI adapter cassette with the supports and stabilizer in place

Adapter-cassette retainer placement for mid-sized adapters

- Remove the adapter stabilizer **C**. See Figure 49 on page 514.
- Place and lock the retainers **B**.
- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.



IPHA523-1

Figure 49. Medium-length adapter in the PCI adapter cassette with the supports in place

Adapter-cassette retainer placement for small adapters

- Remove the adapter stabilizer **C**. See Figure 50 on page 515.
- Place the hook arm **D** into the hole in the corner of the adapter. This supports the card when it is undocked from the connector on the system backplane.
- Place and lock the retainers **B**.
- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

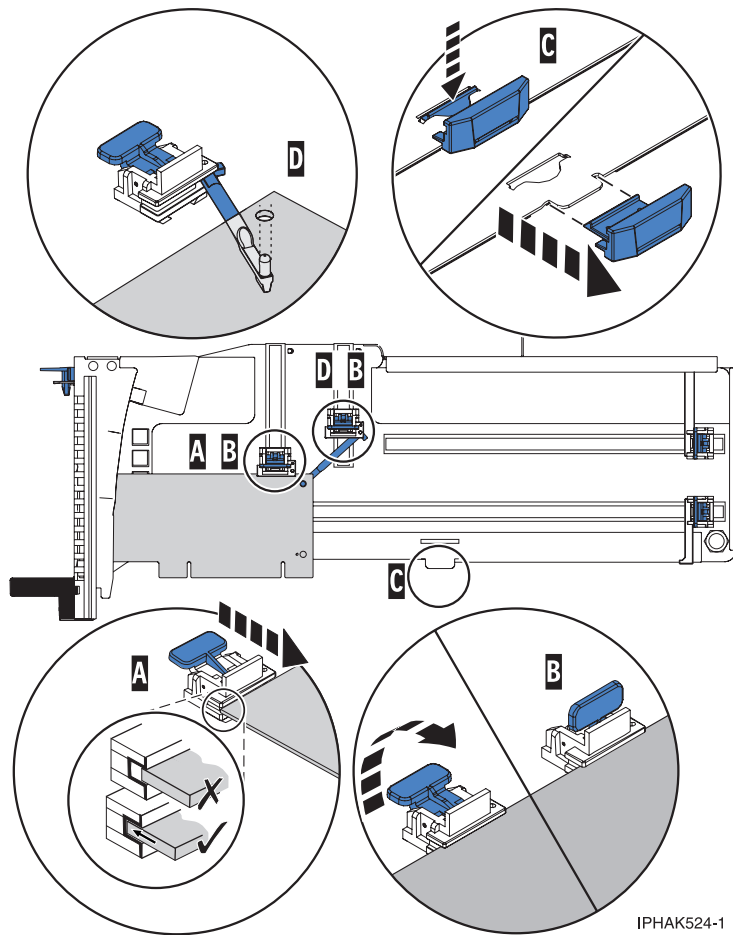
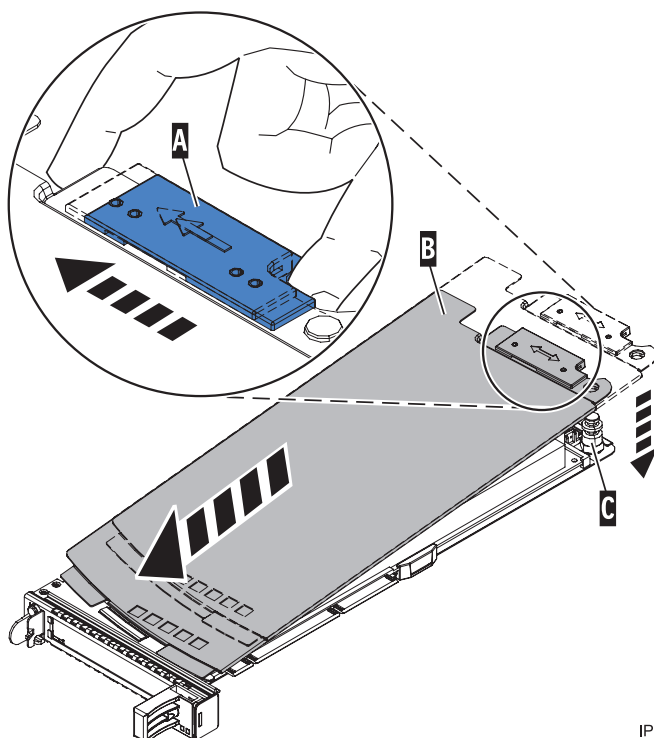


Figure 50. Short adapter in the PCI adapter cassette with the supports and the hook arm in place

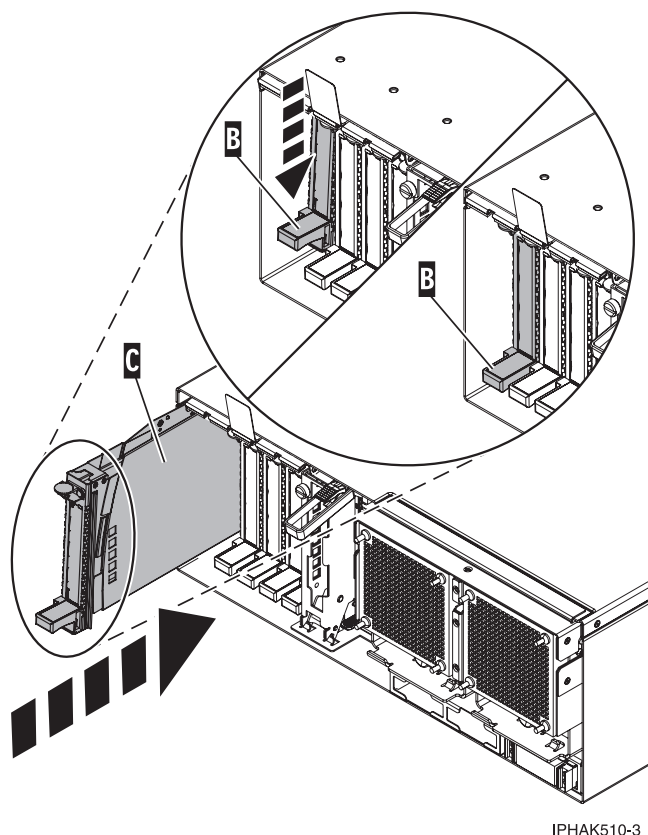
- d. Replace the cassette cover by doing the following steps:
 - 1) Slide the cover **B** into position on the cassette.
 - 2) While holding the cover latch **A** in the open position, place the cover over the pivot pin **C**.
 - 3) Release the cover latch to lock the cover into place.



IPHA530-0

Figure 51. PCI adapter cassette cover replaced

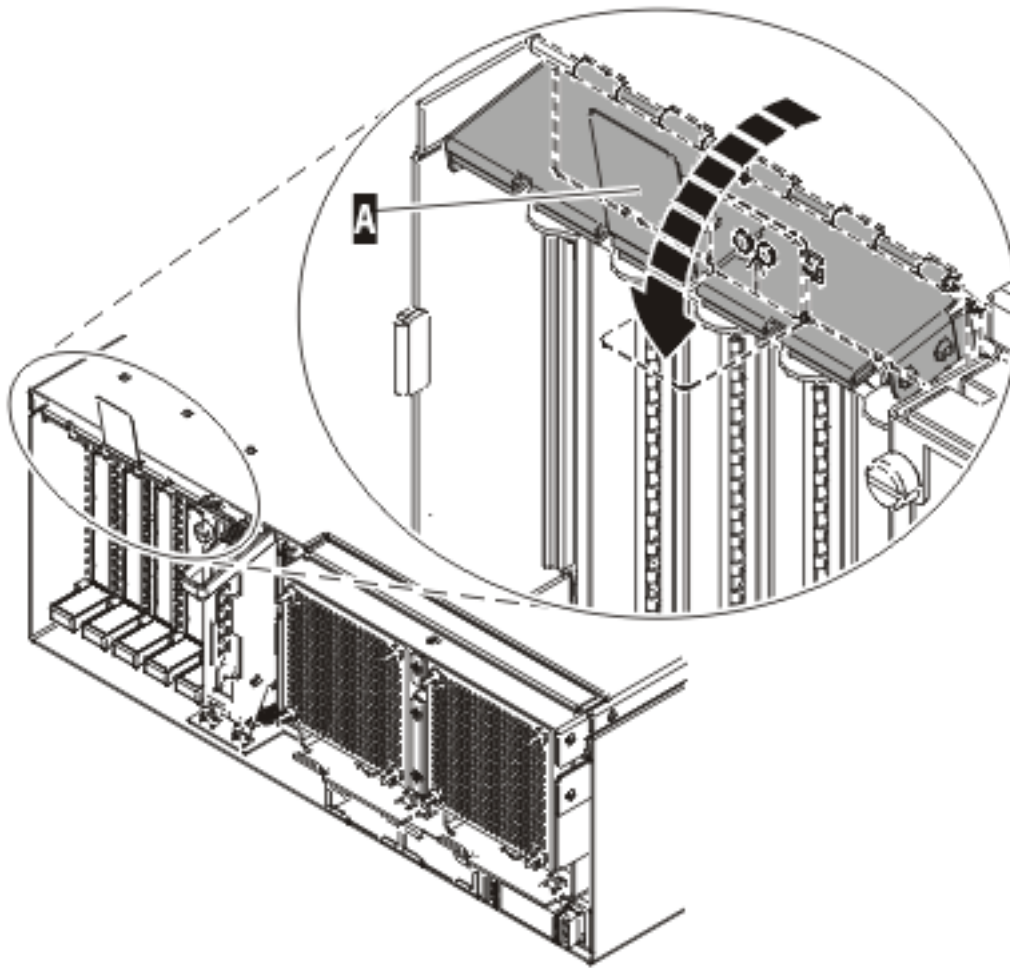
22. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
23. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be docked in the system.
24. Lift and hold the PCI adapter EMC shield in the open position. See Figure 42 on page 507 and Figure 43 on page 508.
25. Slide the cassette **C** into the cassette slot as shown in the following figure.
26. When the cassette is fully inserted into the system, firmly press downward on the lower cassette handle **B** to lock the adapter in its connector.



IPHAK510-3

Figure 52. PCI adapter cassette removed from the system unit

27. Connect the adapter cables.
28. Lower the PCI adapter EMC shield **A** into the closed position, close the shield latch, then close the rear rack door.



IPHAK508-0

Figure 53. PCI adapter EMC shield in the closed position

29. Return to your terminal and the i5/OS screen.
30. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
31. Select **Assign** to on the resource that has an asterisk (*) on the Work with Controlling Resource display. Press Enter.
32. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message: Power on complete
The device is now configured. **This ends this procedure.**

C6 PCI adapter

Use this procedure to service a PCI adapter in location P1-C6.

1. Choose concurrent or nonconcurrent repair.

You may service a PCI adapter concurrently or nonconcurrently.

Will you be doing a concurrent repair?

No	Yes
↓	Go to 521.

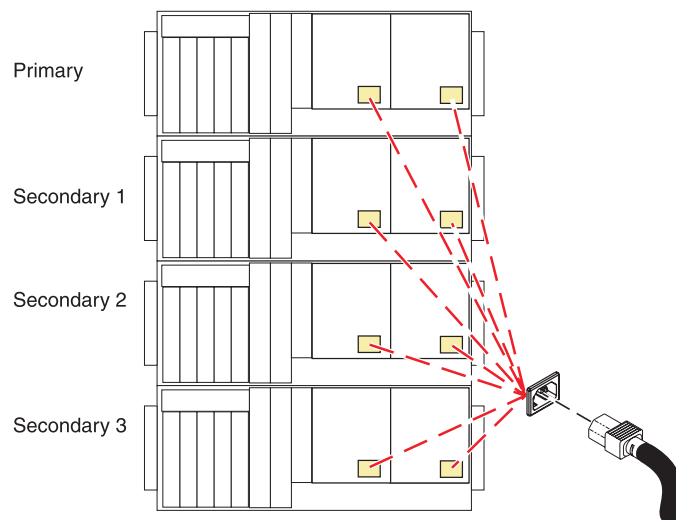
2. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.

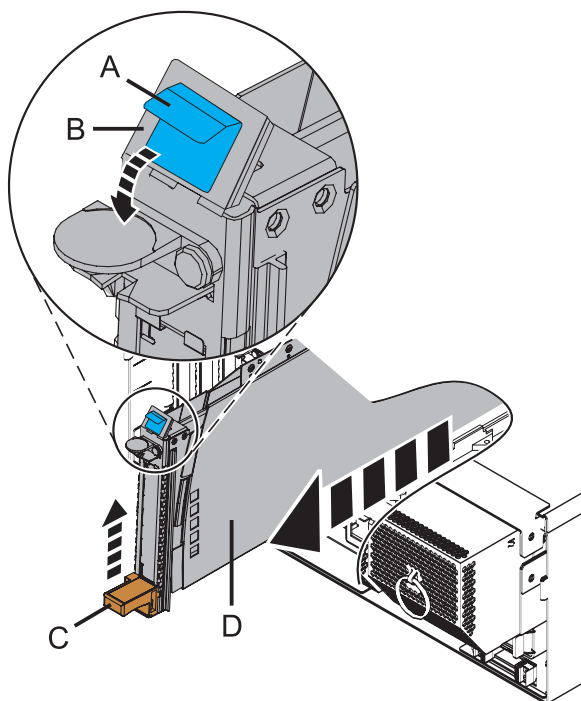


3. Open the back rack door

Open the back rack door.

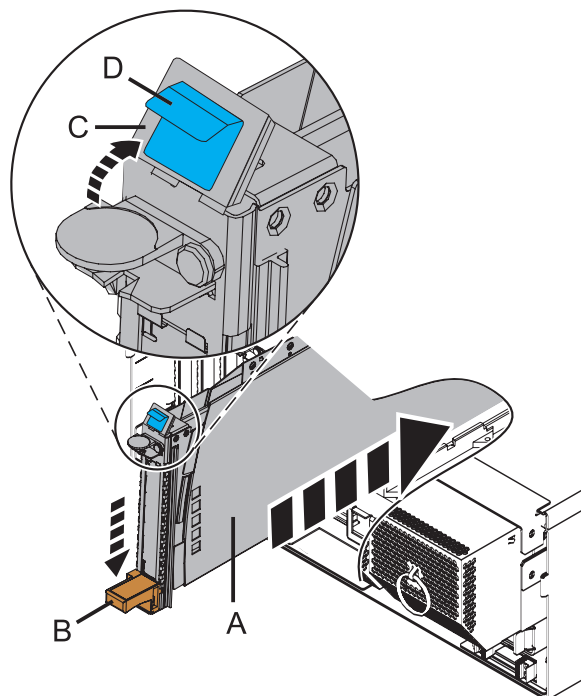
4. Remove the PCI Adapter in slot C6

1. Lift up the blue tab **(A)**, then pull it towards you to let the flap **(B)** drop down.
2. With the flap down, lift up the lower cassette handle **(C)**.
3. Pull the PCI cassette **(D)** out of the system unit.



5. Install the PCI Adapter in slot C6

1. With the flap down, slide the adapter **(A)** into the adapter slot.
2. When the adapter is fully inserted into the slot, firmly press downward on the lower adapter handle **(B)**.
3. Rotate the flap **(C)** up as far as it will go, then slide the blue tab **(D)** down to lock the flap in place.



6. Close the back rack door

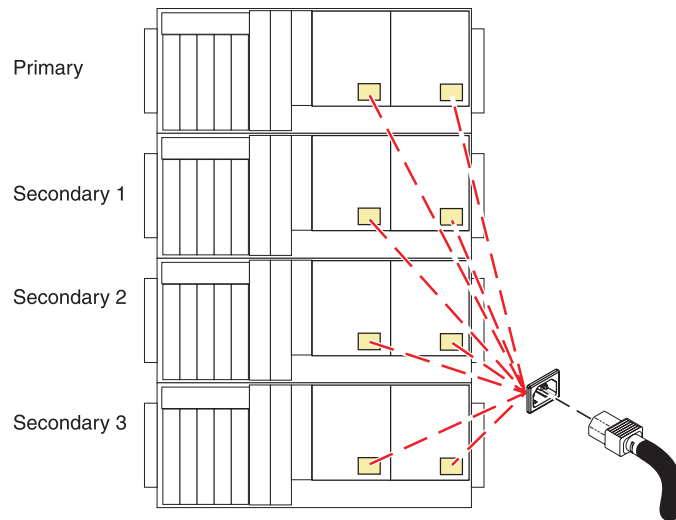
Close the back rack door.

7. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



8. Verify the repair

Go to Chapter 5, “Verifying a repair,” on page 611.

If you are doing a concurrent repair using AIX, go to “Remove and replace a PCI adapter contained in a cassette in the system with the power on in AIX” on page 478.

Power supply

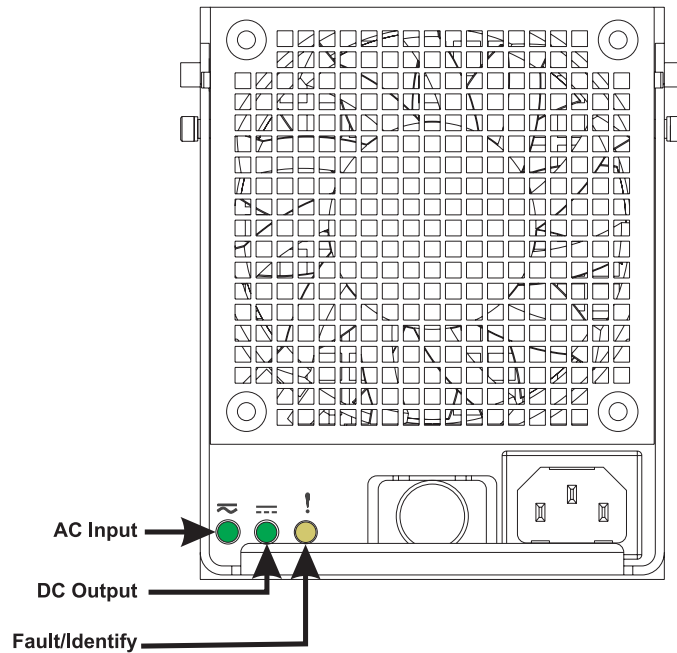
Use this procedure to service the power supply.

1.

You must determine if the repair can continue concurrently. To continue the repair concurrently, the following conditions must be true:

- Another power supply must already be installed . This power supply has three LEDs. The LEDs must be set as follows:
- AC Input - on, not blinking
- DC Output - on, not blinking
- Fault/Identify - off

If any of these conditions are not met, the repair can continue only after powering off the unit containing the FRU that is being repaired. If the unit is already powered off, you may proceed with a non-concurrent repair.



2.

Continue the repair concurrently or nonconcurrently.

Concurrent repair. Continue the repair with unit power on.

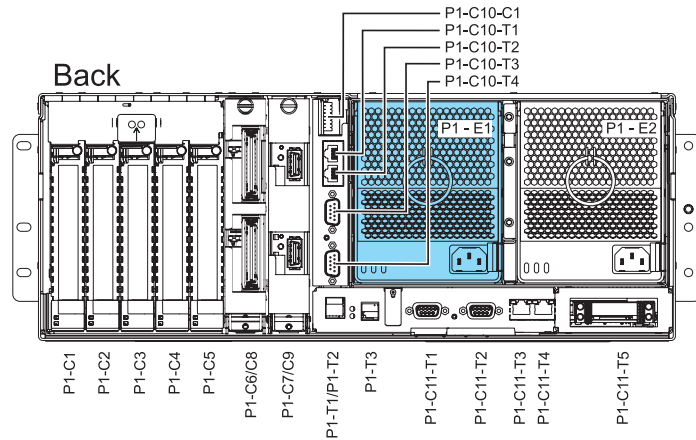
↓

Non-concurrent repair. Power off the unit and continue the repair.

Go to step 6 on page 524.

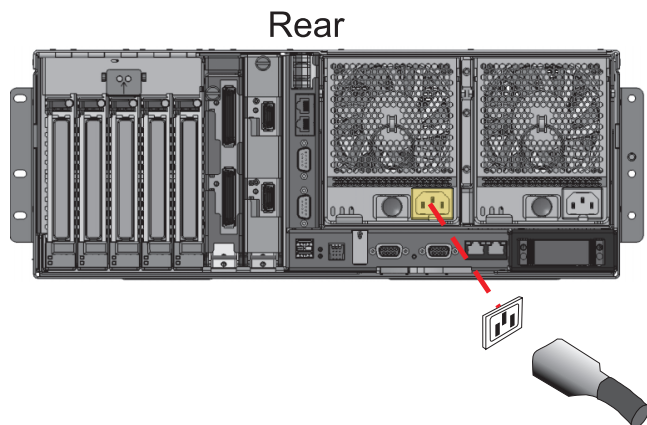
3. Use this procedure to service the Power Supply.

The component will be serviced concurrently.
Power should not be removed from the unit
containing the FRU in the location field above
during this procedure.



4. Disconnect the power cord

Disconnect the power cord from the power
supply being serviced.



5.

Continue with step 7 on page 524.

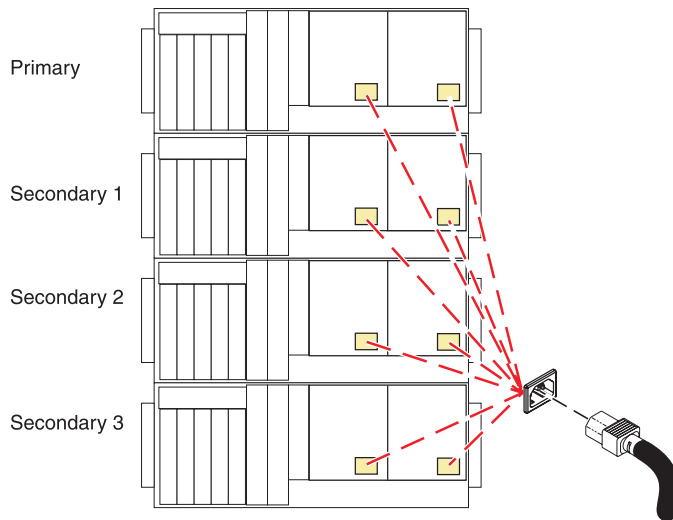
6. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

If possible, shut down any running applications and the operating system before powering off the system.

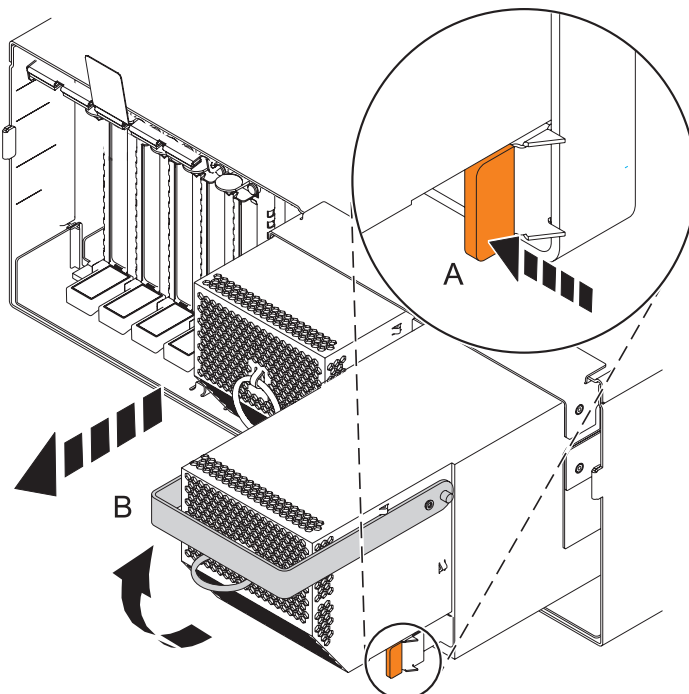
Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



7. Remove the power supply

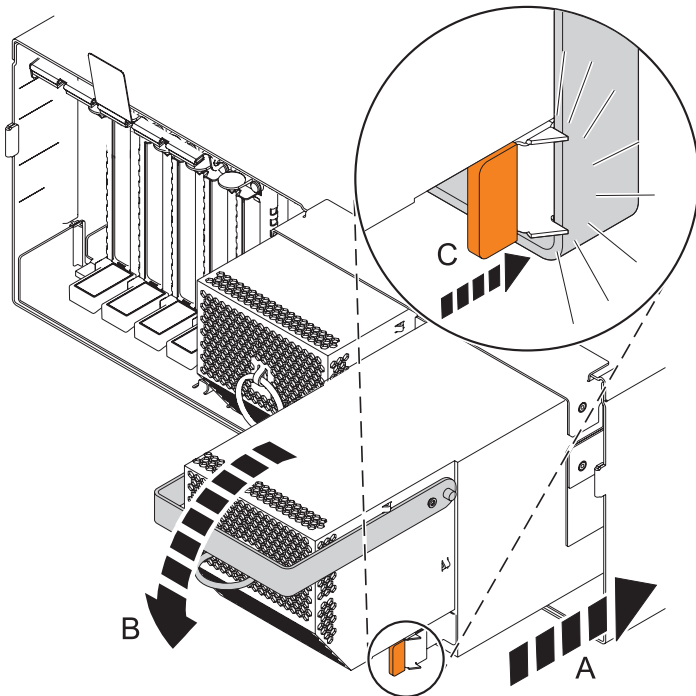
NOTE: If this is a concurrent repair, two power supplies must be present in the system in order to power on the system unit. If one power supply fails, or you have a system failure that does not stop the fans, the system will continue to operate. You can remove and replace the power supply with the system power on if it is done in LESS THAN FIVE MINUTES. After five minutes, the system will power down to prevent the system from over heating.

1. Push the handle latch **(A)** to release the handle.
2. Lift the handle **(B)** up and into the open position.
3. Using the handle, pull the power supply out of the power supply bay. **CAUTION:** This part or unit is heavy, but has a weight smaller than 18 kilograms (39.7 pounds). Use care when lifting, removing, or installing this part or unit. (C008)



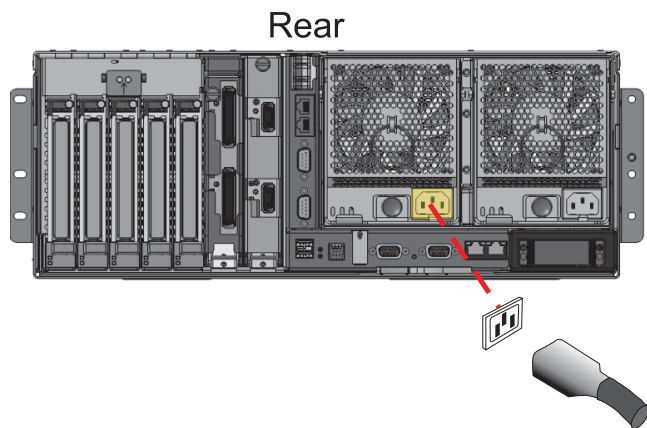
8. Install the new power supply

1. With the handle and latch in the open position, place the power supply in the power supply bay **(A)**.
2. Push the power supply completely into the power supply bay.
3. Close the handle **(B)**, and then push the handle latch into the closed position **(C)**.



9. Connect the power cord

Connect the power cord to the newly installed power supply.



10.

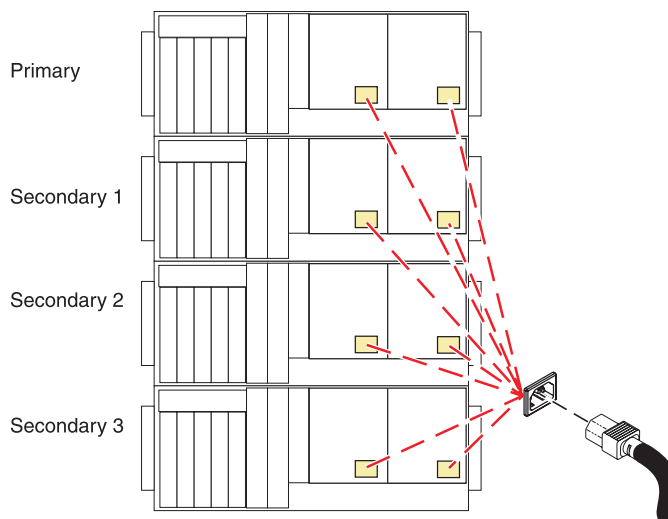
If you are performing a concurrent repair, go to step 13 on page 526.

11. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



12. Power On the System

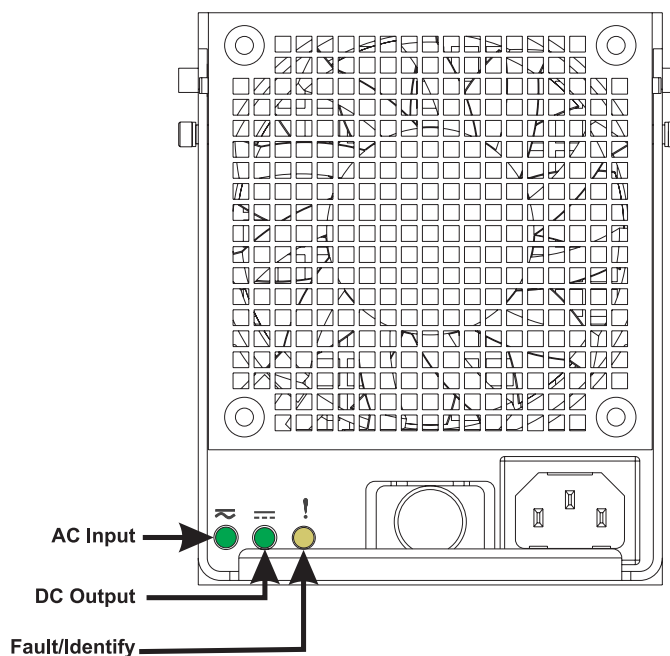
Power on the system. For instructions, refer to “Powering on and powering off” on page 641.

13.

You must determine if the new power supply is operational. The new power supply is operational if its LEDs are set as follows:

- AC Input - on, not blinking
- DC Output - on, not blinking
- Fault/Identify - blinking or off

If the LEDs are set differently, you must determine why. Make sure the power supply is plugged into a working AC power source, try installing a different power supply, or call your next level of support.



14. **Verify the repair**

Go to Chapter 5, “Verifying a repair,” on page 611.

Removable media

Use this procedure to replace the removable media device.

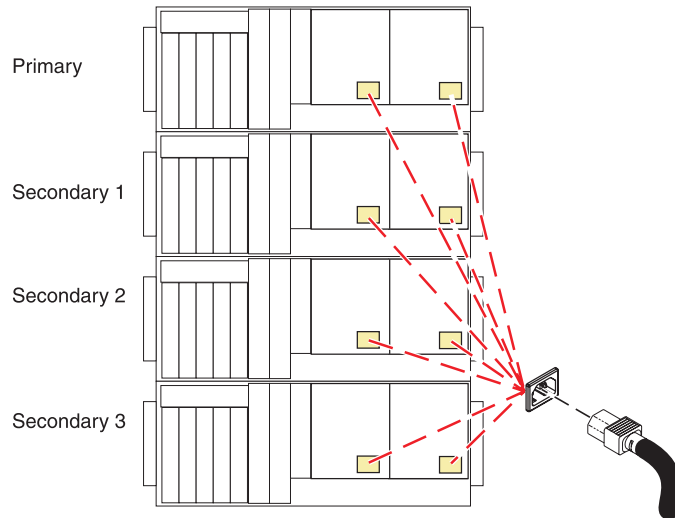
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

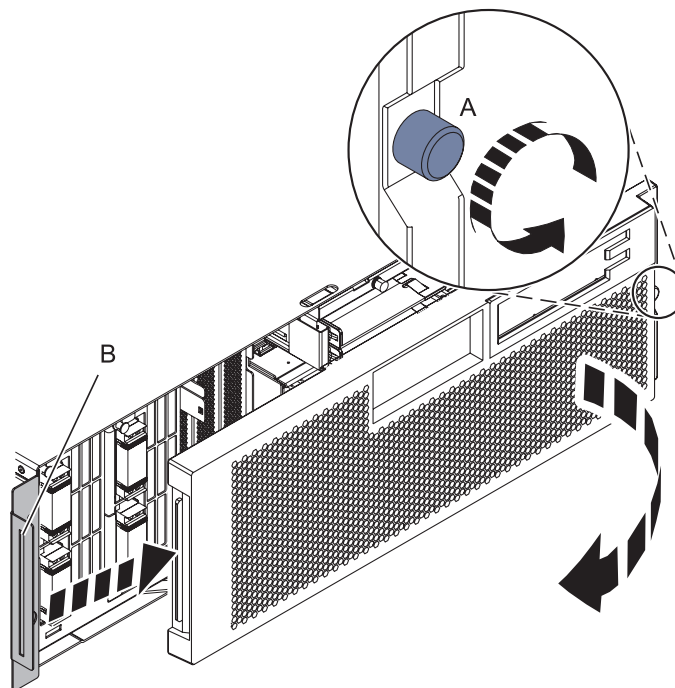
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



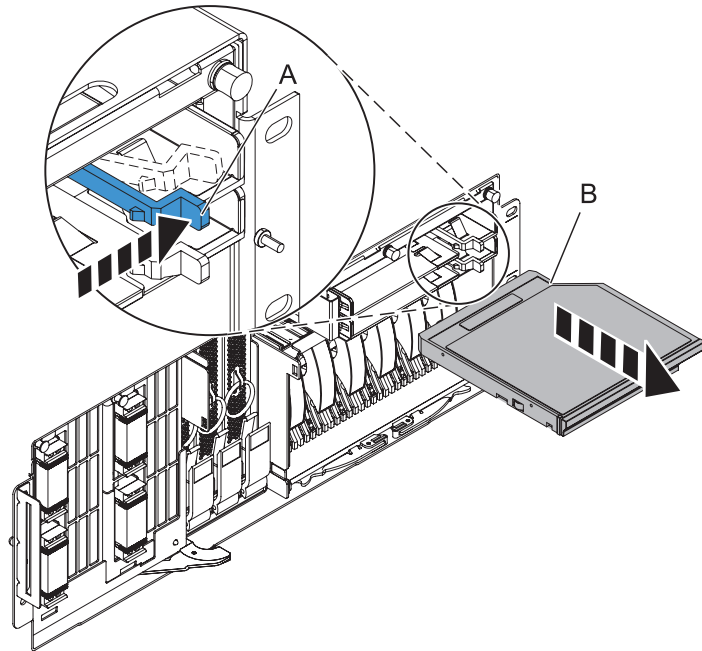
2. Remove the Front Cover

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



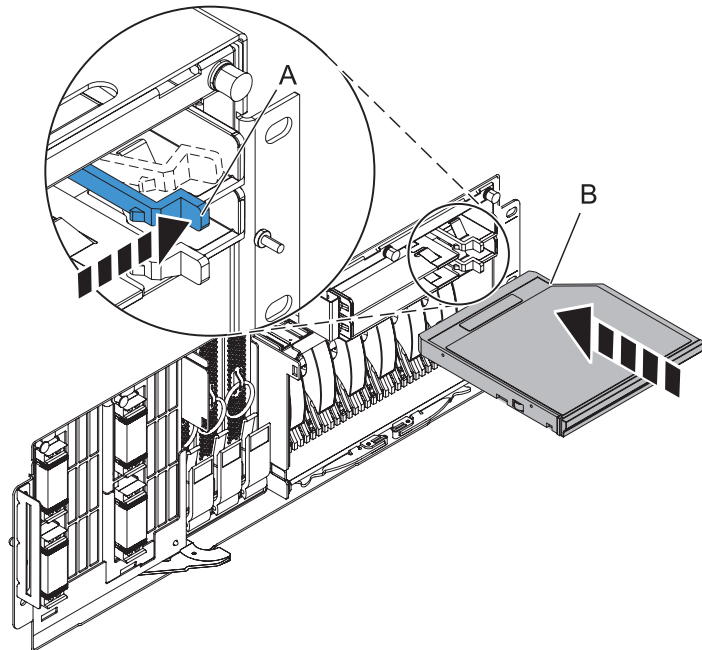
3. Remove the removable media device

While pushing out on the blue plastic retaining tab **(A)**, grasp the device **(B)** and pull it out of the system unit.



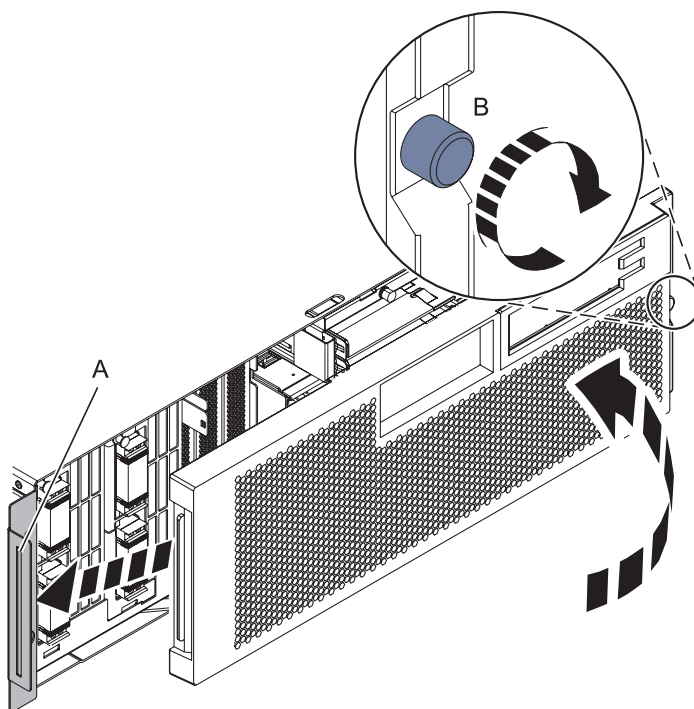
4. Install the removable media device

1. Align the device with the Slimline media bay.
2. While pushing out on the blue plastic retaining tab **(A)**, push the device **(B)** fully into the system.



5. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot **(A)** on the left side of the system unit.
2. Tighten the thumbscrew **(B)** on the right side of the cover.
3. Close the front rack door.

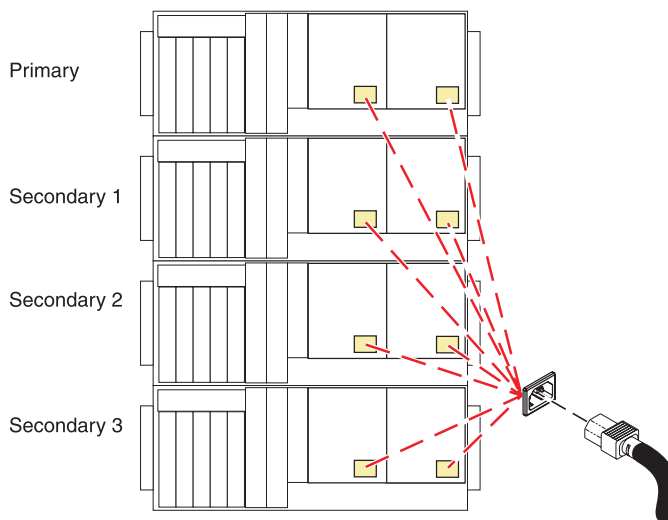


6. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



7. Verify the repair

Go to Chapter 5, "Verifying a repair," on page 611.

Service processor assembly and time-of-day battery

Use this procedure to service the service processor assembly and time-of-day battery.

1. **Note:**

The following maintenance procedure will take 30 minutes or longer to complete. The system will be unavailable until the maintenance procedure is completed. If the system can not remain unavailable for this time period, then the procedure must be delayed.

Select option

Proceed with the service action	Delay the service action
↓	This ends the procedure.

2. **Choose the type of service for the service processor assembly.**

Select an option:

- To repair a single service processor, go to “Repair a single service processor assembly” on page 536.
 - To repair a redundant service processor, go to “Repair a redundant service processor assembly” on page 549.
-

“Add a redundant service processor assembly”
Use this procedure to add redundant service processor assembly.

“Repair a single service processor assembly” on page 536
Use this procedure to repair a single service processor assembly.

“Repair a redundant service processor assembly” on page 549
Use this procedure to repair a service processor assembly and time-of-day battery.

Add a redundant service processor assembly

Use this procedure to add redundant service processor assembly.

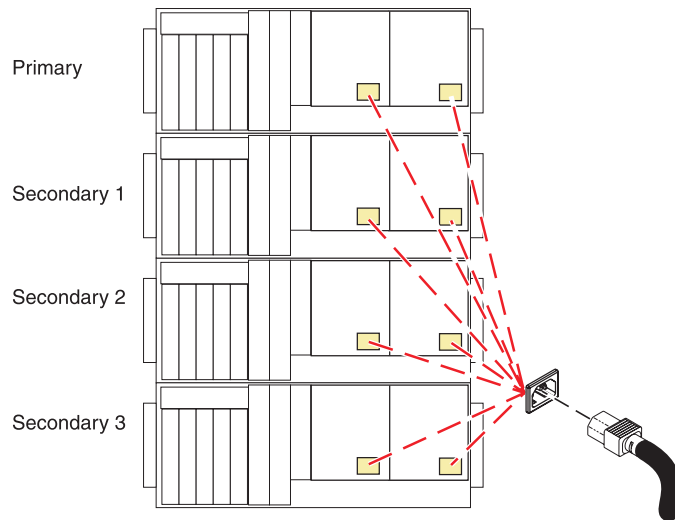
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

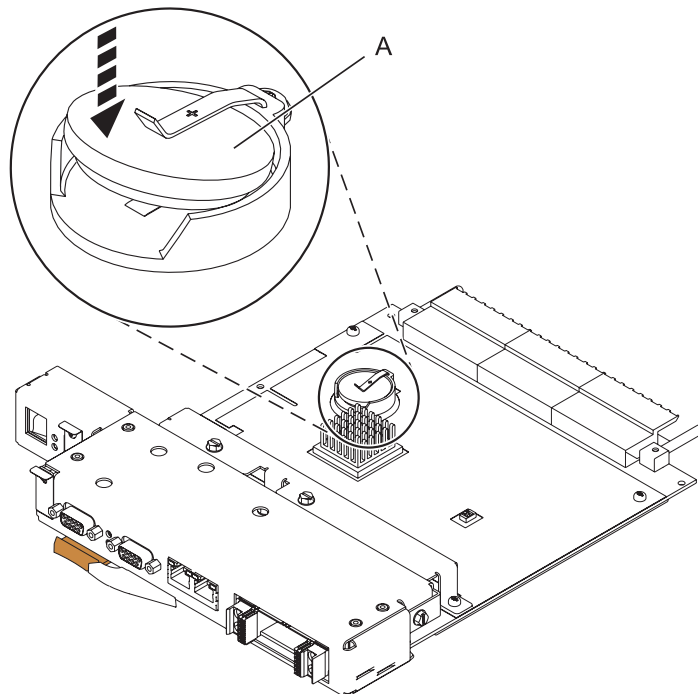
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



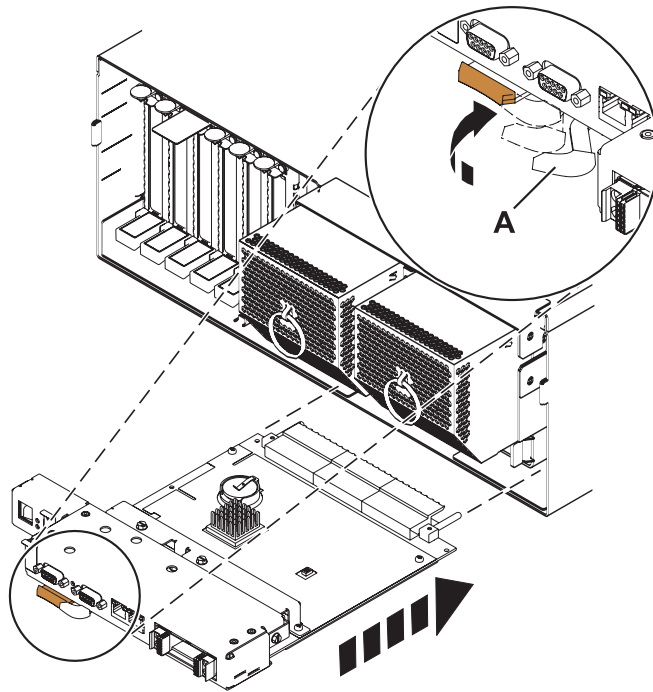
2. Install the Time-Of-Day Battery

If a time-of-day battery (**A**) is not present, install one in the new service processor assembly.



3. Install the Service Processor Assembly

1. Align the service processor assembly with the card slot.
2. Slide the service processor assembly all the way into the card slot in the card enclosure.
3. Push the handle **(A)** towards the service processor assembly until the release tab locks the handle in place. This will secure the service processor assembly into the card slot.
4. Reconnect all service processor assembly cables.



4. Restore Network Connectivity

The installed Service Processor must connect to the network to be accessible from the HMC.

How will the IP Address of the Service Processor be managed?

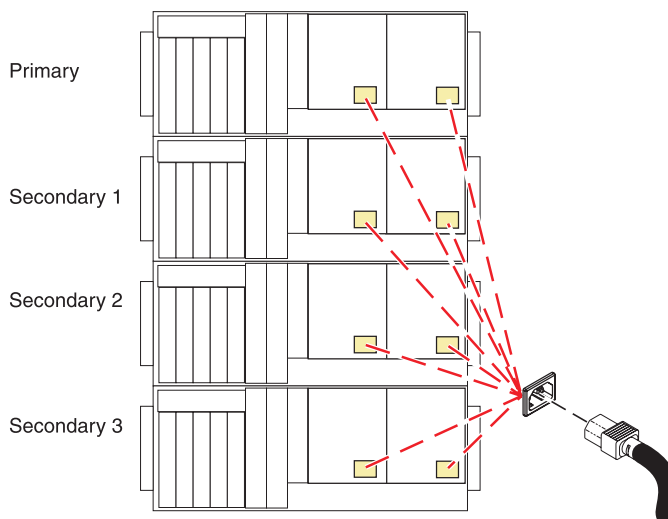
Configure a static IP Address	Obtain an IP Address automatically from a DHCP server
↓	Go to step 10 on page 536

Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



5. Power On the System

Power on the system. For instructions, refer to “Powering on and powering off” on page 641.

6. To configure the PC or mobile computer to access ASMI:

The Advanced System Management Interface (ASMI) will be used to configure the new Service Processor. A PC or mobile computer must be connected to the Service Processor to access ASMI.

To configure the PC or mobile computer to access ASMI

1. Connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC1, or the Ethernet port labeled HMC2 on the Service Processor being serviced.
2. Configure the Ethernet interface on the PC or mobile computer to an IP address and subnet mask within the same subnet as the server, so that your PC or mobile computer can communicate with the Service Processor.

Use the following table to help determine these values:

Service Processor connector	IP address	Subnet mask	Gateway address
HMC1	169.254.2.147	255.255.255.0	169.254.2.1
HMC2	169.254.3.147	255.255.255.0	169.254.3.1

For example, if you connected your PC or mobile computer to HMC1, the IP address for your PC or mobile computer could be 169.254.2.1 and the subnet mask would be 255.255.255.0. Set the gateway IP address to the same IP address as the PC or mobile computer.

7. To connect to the ASMI:

To configure the Service Processor you must connect to the Advanced System Management Interface (ASMI).

To connect to the ASMI

1. Type the ASMI address in the Address field of your PC's or mobile computer's Web browser.
2. When the login display appears, enter one of the following default user IDs and passwords:

User ID	Password
admin	admin

3. Change the default password when prompted

8. To configure the Service Processor's static IP Address:

Configure the Service Processor's static IP Address.

To configure the Service Processor's static IP Address

1. From the navigation area, expand Network Services.
2. Click Network Configuration.
3. If your service processor connects to the network using a static IP address on Ethernet port HMC1, fill in the section labeled Network interface eth0.

If your service processor connects to the network using a static IP address on Ethernet port HMC2, fill in the section labeled Network interface eth1.

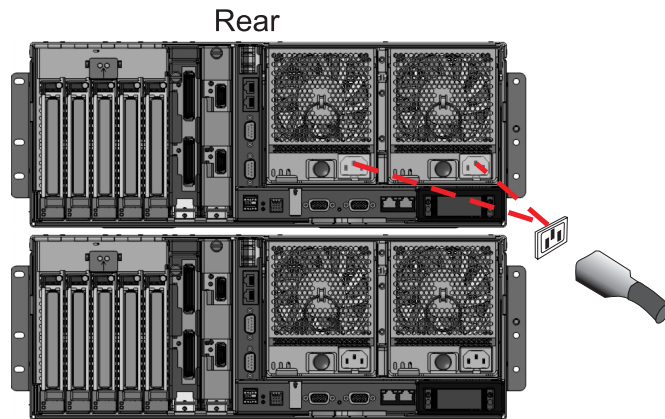
4. Ensure that the following fields are filled in correctly:

Field	Value
Configure this interface?	Yes
Type of IP address	Static
IP address	The service Processor's static IP address
Subnet mask	255.255.255.0

5. Click **Continue** and verify your settings on the Network Configuration panel.
6. Click **Save Settings** to complete the static IP Address configuration.

9. Unplug service processor enclosure

Disconnect the AC power source from the enclosure.



10.

Note: If you can not access the ASMI, or if the system will not power-on, after exchanging a service processor assembly, you might have a server firmware level problem. If the new service processor assembly contains an earlier release of server firmware than you were using, it might not support your current hardware configuration. You will need to update your server firmware using the USB port on the service processor assembly. Refer to *Service Guide for the Hardware Management Console Models 7042-CR4, 7042-C06 and 7042-C07, SA76-0120*.

11.

Verify the repair.

Go to Chapter 5, "Verifying a repair," on page 611.

Repair a single service processor assembly

Use this procedure to repair a single service processor assembly.

1. Check and record the server firmware and service processor settings

1. Check and record the server firmware level prior to replacing this FRU. You may need to update the system to the latest server firmware code level after you replace this FRU.
 2. Check and record the service processor settings you previously set using the Advanced System Management Interface (ASMI). This can be done using a Hardware Management Console (HMC) or PC to access ASMI. You will need to reset these service processor settings after you replace this FRU or the default settings will be used. Settings to check include the following:
 - System Name setting.
 - System Power Control settings.
 - System Service Aids settings.
 - System configuration settings.
 - Network Services settings.
 - Performance Option settings.
 - Login Profile settings.
 3. Record the processing unit power control network identifier using the ASMI.
 4. Also record any service processor settings you may have set using operating system commands.
-

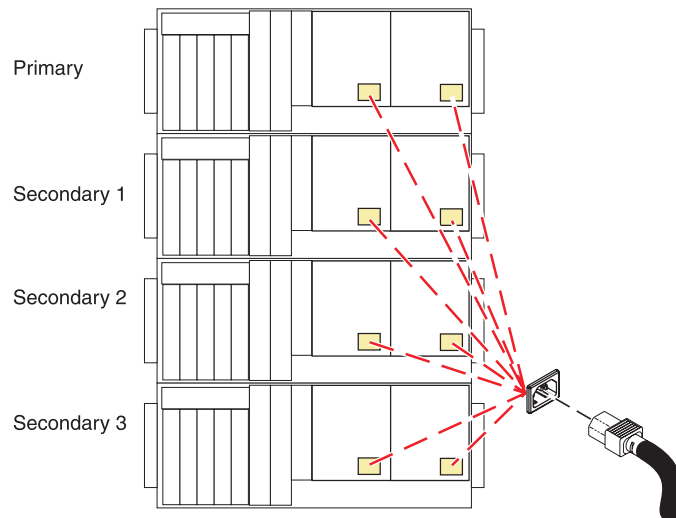
2. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

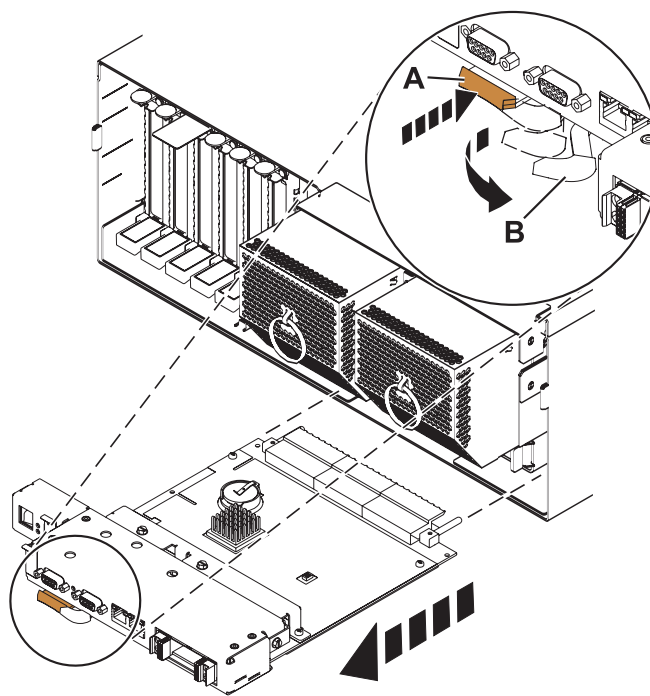
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



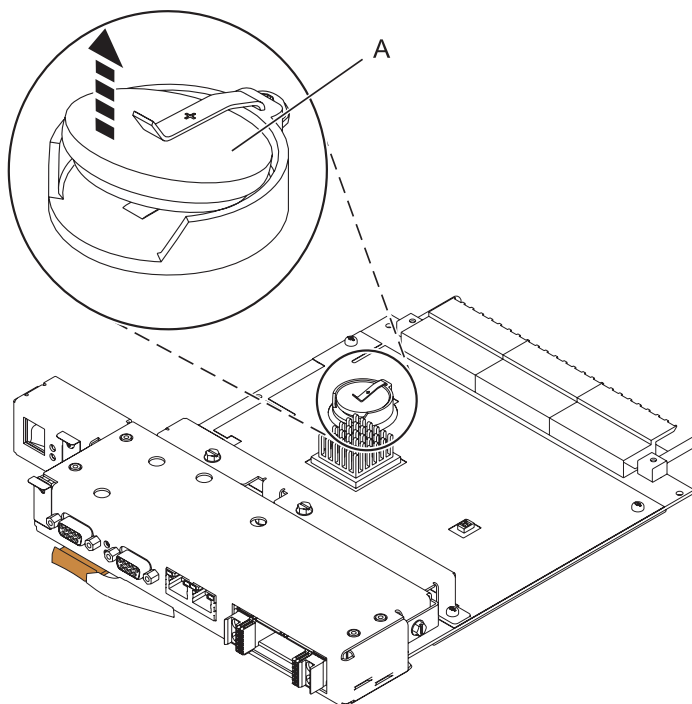
3. Remove the Service Processor Assembly

1. Label and disconnect all cables connected to the service processor assembly.
2. Press the thumb release **(A)** on the service processor assembly to unlock the handle.
3. Pull the handle to the right to unseat the service processor assembly.
4. Pull the service processor assembly from the card enclosure using the handle and supporting the bottom of the card.



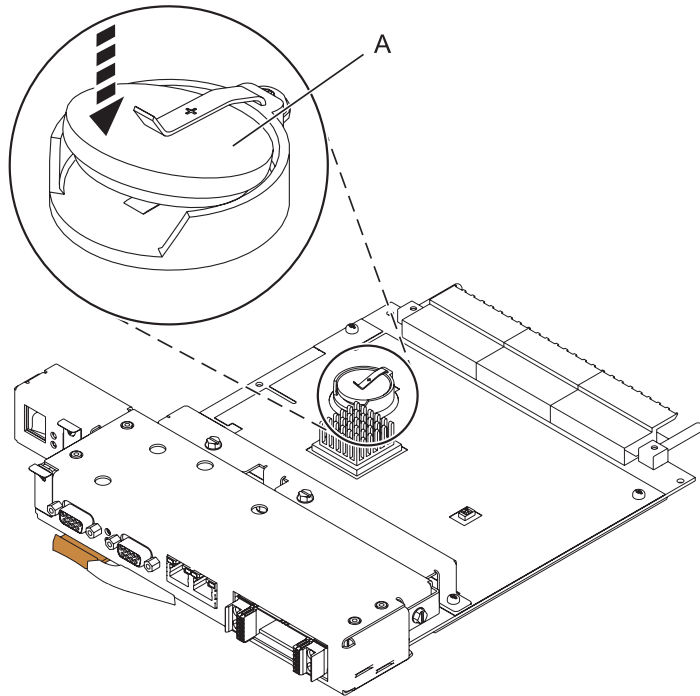
4. Remove the Time-Of-Day Battery

Remove the time-of-day battery **(A)** from its slot as shown.



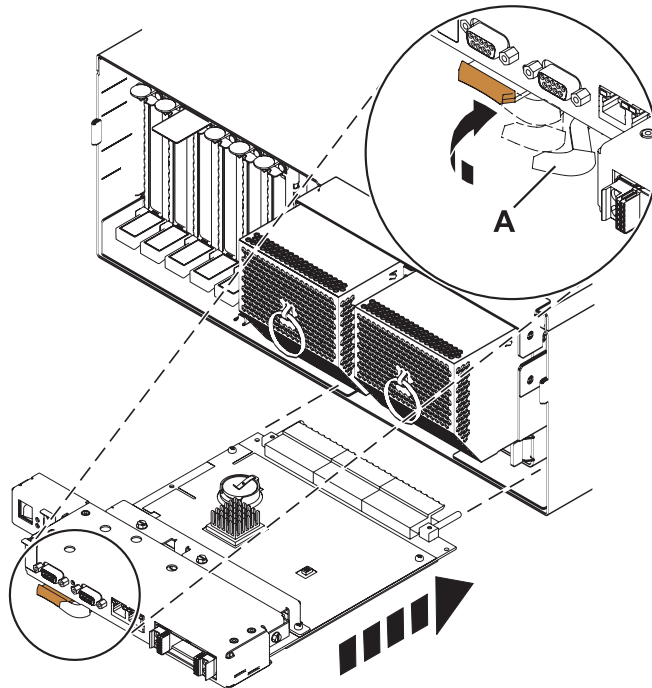
5. Install the Time-Of-Day Battery

If a time-of-day battery (**A**) is not present, install one in the new service processor assembly.



6. Install the Service Processor Assembly

1. Align the service processor assembly with the card slot.
2. Slide the service processor assembly all the way into the card slot in the card enclosure.
3. Push the handle (**A**) towards the service processor assembly until the release tab locks the handle in place. This will secure the service processor assembly into the card slot.
4. Reconnect all service processor assembly cables.

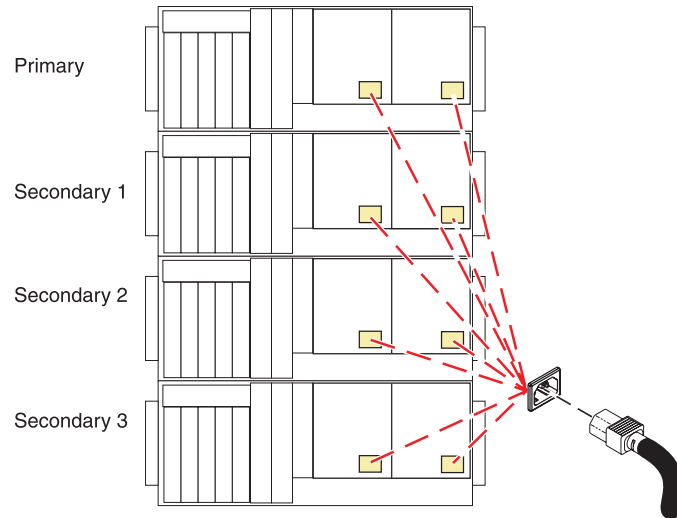


7. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



8. Restore Network Connectivity

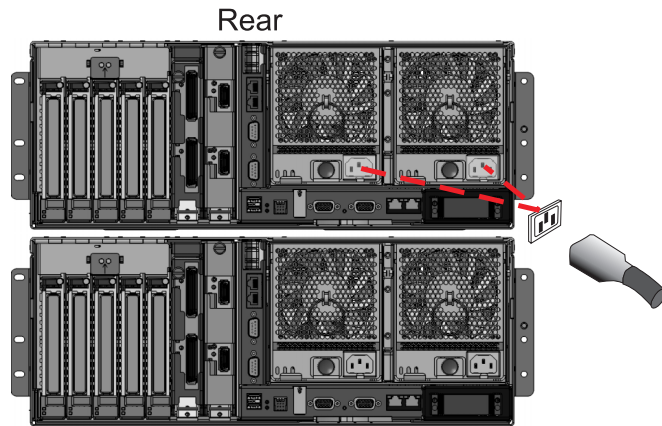
The installed Service Processor must connect to the network to be accessible from the HMC.

How will the IP Address of the Service Processor be managed?

Configure a static IP Address	Obtain an IP Address automatically from a DHCP server
↓	Go to step 16 on page 544

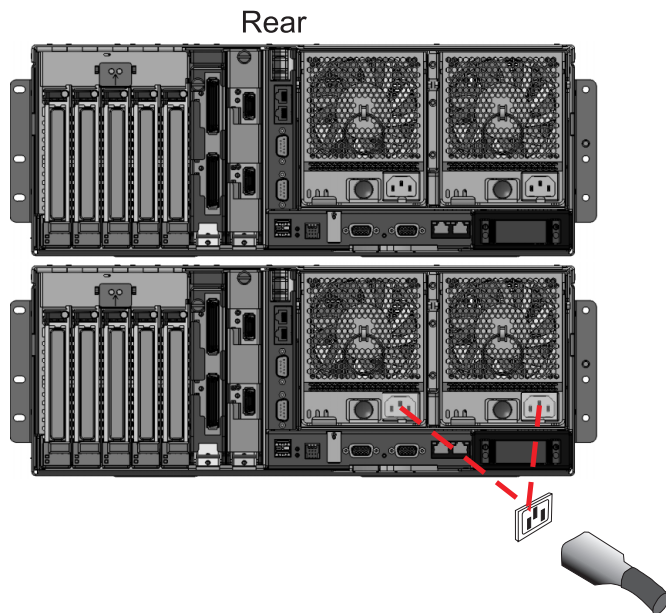
9. Plug In Top Enclosure

Connect the AC power source to the top enclosure.



10. Plug In Second Enclosure

Connect the AC power source to the second enclosure.



11. To configure the PC or mobile computer to access ASMI:

The Advanced System Management Interface (ASMI) will be used to configure the new Service Processor. A PC or mobile computer must be connected to the Service Processor to access ASMI.

To configure the PC or mobile computer to access ASMI

1. Connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC1, or the Ethernet port labeled HMC2 on the Service Processor being serviced.
2. Configure the Ethernet interface on the PC or mobile computer to an IP address and subnet mask within the same subnet as the server, so that your PC or mobile computer can communicate with the Service Processor.

Use the following table to help determine these values:

Service Processor connector	IP address	Subnet mask	Gateway address
HMC1	169.254.2.147	255.255.255.0	169.254.2.1
HMC2	169.254.3.147	255.255.255.0	169.254.3.1

For example, if you connected your PC or mobile computer to HMC1, the IP address for your PC or mobile computer could be 169.254.2.1 and the subnet mask would be 255.255.255.0. Set the gateway IP address to the same IP address as the PC or mobile computer.

12. To connect to the ASMI:

To configure the Service Processor you must connect to the Advanced System Management Interface (ASMI).

To connect to the ASMI

1. Type the ASMI address in the Address field of your PC's or mobile computer's Web browser.
2. When the login display appears, enter one of the following default user IDs and passwords:

User ID	Password
admin	admin

3. Change the default password when prompted
-

13. To configure the Service Processor's static IP Address:

Configure the Service Processor's static IP Address.

To configure the Service Processor's static IP Address

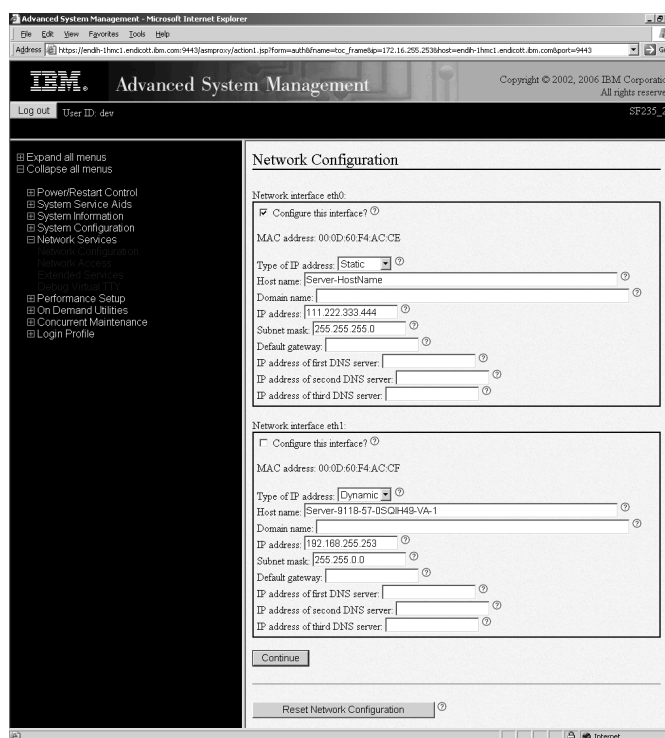
1. From the navigation area, expand Network Services.
2. Click Network Configuration.
3. If your service processor connects to the network using a static IP address on Ethernet port HMC1, fill in the section labeled Network interface eth0.

If your service processor connects to the network using a static IP address on Ethernet port HMC2, fill in the section labeled Network interface eth1.

4. Ensure that the following fields are filled in correctly:

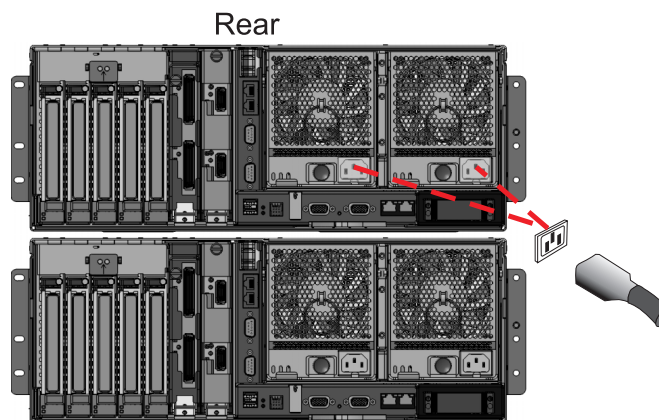
Field	Value
Configure this interface?	Yes
Type of IP address	Static
IP address	The service Processor's static IP address
Subnet mask	255.255.255.0

5. Click **Continue** and verify your settings on the Network Configuration panel.
6. Click **Save Settings** to complete the static IP Address configuration.



14. Unplug service processor enclosure

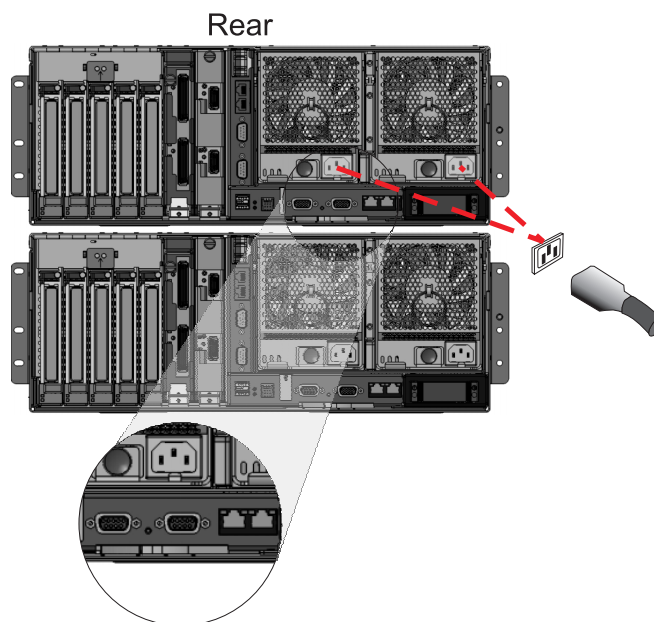
Disconnect the AC power source from the enclosure.



15. Connect the top drawer to the managed system

1. Reconnect the ethernet and any other cables that were disconnected during the Service Processor removal.
2. Reconnect the AC power source.

Click **Next** to complete the service procedure.



16. Restore Service Processor Settings

With the network connection now configured to use static IP address assignments, access the service network.

Can you access the service network?

Yes	No
arrow down	link button 2

17. Restore Service Processor Settings

Enable network access to the service processor by doing the following:

If the network connection uses the Dynamic Host Configuration Protocol (DHCP) to establish an IP address, and uses the Hardware Management Console (HMC) as the DHCP server, no additional configuration is necessary to enable network access to the service processor. Do the following:

1. Ensure that the service processor is connected to the existing service network by verifying that the HMC cable is connected to the HMC port on the service processor assembly.
2. If not already connected, connect all system power cables by plugging them into power outlets. **NOTE:** Do not start the system at this time.

Can you access the service network?

No	Yes
↓	Go to step 22 on page 546.

18. Restore Service Processor Settings

If the network connection uses DHCP to establish an IP address, but does not use an HMC as the DHCP server, do the following:

1. Complete any network configuration necessary to allow the DHCP server to recognize and assign an IP address to the service processor.
2. Ensure that the service processor is connected to the existing service network by verifying that the network cable is connected to the network port on the service processor assembly.
3. If not already connected, connect all system power cables by plugging them into power outlets. **NOTE:** Do not start the system at this time.

Can you access the service network?

No	Yes
↓	Go to step 22 on page 546.

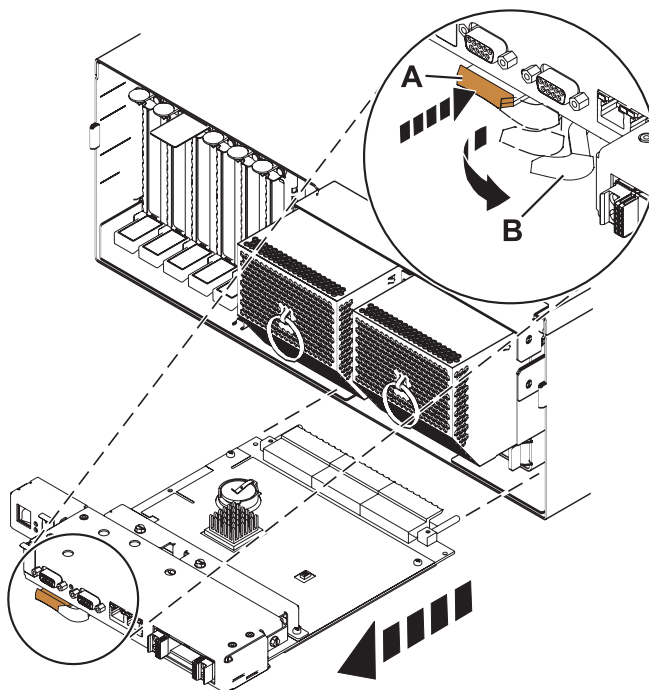
19. Restore Service Processor Settings

You have indicated that you are still not able to access the service network.

You will need to reset the service processor network interfaces (and passwords) as instructed on the following set of panels. Before proceeding, to reset the service processor, disconnect the power cords from the enclosure being serviced.

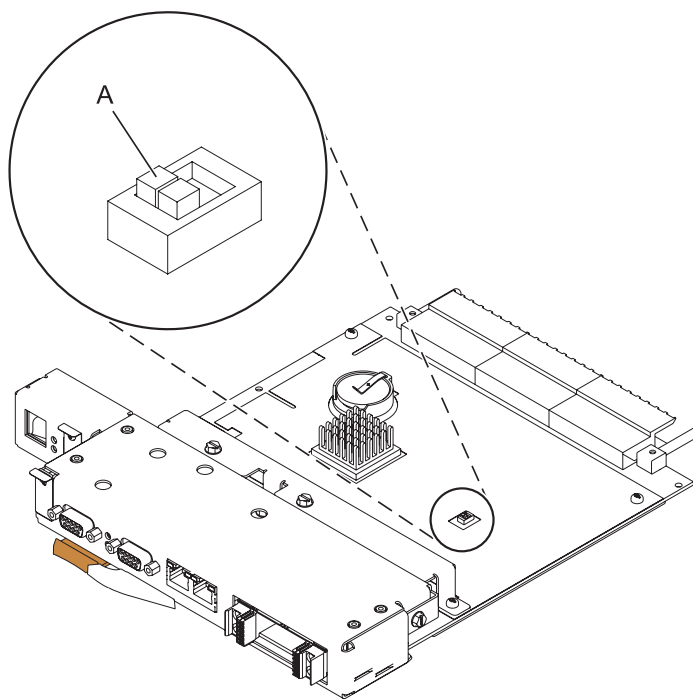
20. Remove the Service Processor Assembly

1. Label and disconnect all cables connected to the service processor assembly.
2. Press the thumb release **(A)** on the service processor assembly to unlock the handle.
3. Pull the handle to the right to unseat the service processor assembly.
4. Pull the service processor assembly from the card enclosure using the handle and supporting the bottom of the card.



21. Restore Service Processor Settings

Move both service processor reset jumpers **(A)** from their current position to the opposite position.



Go to step 5 on page 539.

22. Restore Service Processor Settings

1. Log on to the ASMI with the user ID admin and the default password admin.
2. Change the admin user ID's password and the general user ID's password when prompted by following these steps:
 - a. On the ASMI Welcome pane, specify your user ID and password, and click Log In.
 - b. In the navigation area, expand Login Profile.
 - c. Select Change Password.
 - d. Specify the required information, and click Continue.
- 3.

NOTE: Passwords can be any combination of up to 64 alphanumeric characters. The default password for the general user ID is general, and the default password for the administrator ID is admin. After your initial login to the ASMI and after the reset toggle jumpers are moved, the general user and administrator passwords must be changed.

As a security measure, you are required to enter the password for your user ID in the Current password for current user field. This password is not the password for the user ID you want to change.

23. Restore Service Processor Settings

Set the system name. The system name can be changed to any valid ASCII string. It does NOT have to follow the initialized MachineType-Model#-Serial# format.

To change the system name, do the following:

1. In the navigation area, expand System Configuration.
2. Select System Name.
3. Enter the desired system name using the previous naming convention.
4. Click Save settings to update the system name to the new value.

The new system name is displayed in the status frame, the area where the logout button is located. If another method, such as the HMC, is used to change the system name, the status frame does not reflect the change.

24. Restore Service Processor Settings

Set the time of day.

1. On the ASMI Welcome pane, specify your user ID and password, and click Log In.
2. In the navigation area, expand System Configuration.
3. Select Time of Day. If the system is powered off, the right pane displays a form that shows the current date (month, day, and year) and time (hours, minutes, seconds).
4. Change either the date value or the time value or both, and click Update Time Of Day.

If this server does not use an HMC, set the time of day using the appropriate operating system command.

25. Restore Service Processor Settings

Reenter any of the following settings that you previously changed through the ASMI, unless you want to use the default settings:

1. System power settings.
 2. ASMI service aids settings.
 3. System configuration settings.
 4. Network services settings.
 5. Login profile settings.
-

26. Restore Service Processor Settings

1. Reset any service processor settings that you may have set using operating system commands. You recorded these settings at the beginning of this procedure.
 2. If you choose to reset the HMC access password, do the following:
 3.
 - a. From the HMC GUI (preferred method):
 - b.
 - Expand the **Systems Management** folder in the navigation tree pane.
 - Expand the **Servers** folder.
 - Select the server to be powered off. A list of server-related tasks will display in the **Tasks** pane.
 - Expand the **Configuration** folder in the **Tasks** pane.
 - Under the **Configuration** folder, click the **Update Managed System Password** task.
 - c. Or, from the HMC command line, type:
 - d.

```
chsyspwd -m managed system -t access --passwd --newpasswd newpassword
```

where:
 - The value for managed system is the new service processor's managed system name.
 - No value for --passwd is entered thereby allowing authentication.
 - The value for newpassword is the new password value.
-

27. Recover Partition Data

Profile data stored in the managed server has been cleared or corrupted.

To recover profile data using the HMC, do the following:

1. Click on **Systems Management**.
 2. Click on **Servers**.
 3. Use the checkbox to select the managed system and click on the **Tasks** drop-down menu that appears on the table toolbar.
 4.
 - From the menu, select **Recover Partition Data**.
-

28. Restore Service Processor Settings

If necessary, update to the latest server firmware level. If you are ONLY replacing the battery in a model 570 FSP card, skip this panel.

To upgrade to a new server firmware (Licensed Internal Code) release WITH an HMC, follow these steps:

1. For all models except 59x model servers, it is recommended that you install HMC fixes before you upgrade to a new server firmware release. For 59x model servers, you MUST install HMC fixes before you upgrade to a new server or power subsystem firmware release.
2. From the main WebSM screen, expand the Licensed Internal Code Maintenance folder.
3. Click the Licensed Internal Code Updates icon.
4. In the Contents area, click Upgrade Licensed Internal Code to a new release.
5. In the Target Object Selection window, click the target system, and click OK. The target is the managed system for which you want to upgrade the firmware to a new release.
6. In the Hardware Management Console License Agreement window, read the agreement and click Accept.
7. Follow the on-screen directions to upgrade the system firmware.

The following message might be displayed on the HMC interface: Quiesce any applications currently running on your operating systems for the systems listed below. In this situation, you need to manually shut down all of the applications and logical partitions to prevent the system from shutting them down abnormally. Use the normal procedures for your particular operating system to shut down the logical partitions

29.

Note: If you can not access the ASMI, or if the system will not power-on, after exchanging a service processor assembly, you might have a server firmware level problem. If the new service processor assembly contains an earlier release of server firmware than you were using, it might not support your current hardware configuration. You will need to update your server firmware using the USB port on the service processor assembly. Refer to *Service Guide for the Hardware Management Console Models 7042-CR4, 7042-C06 and 7042-C07, SA76-0120*.

30.

Verify the repair.

Go to Chapter 5, "Verifying a repair," on page 611.

Repair a redundant service processor assembly

Use this procedure to repair a service processor assembly and time-of-day battery.

1.

Note whether the op panel needs to be moved. The op panel needs to be moved if it is on the same side as the service processor assembly that is being repaired.

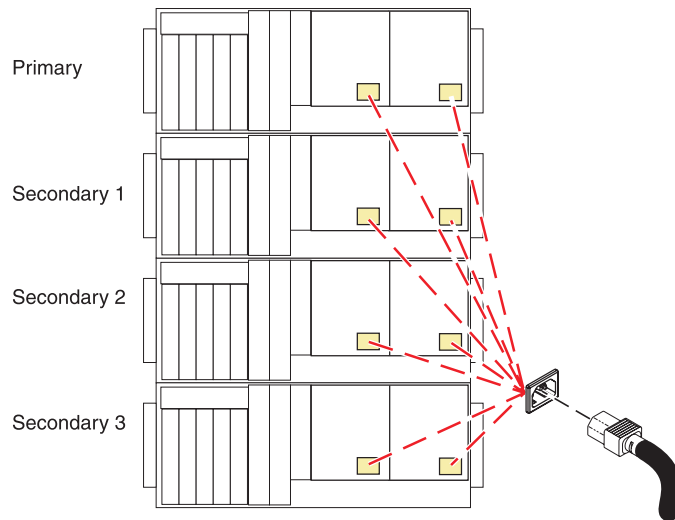
2. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

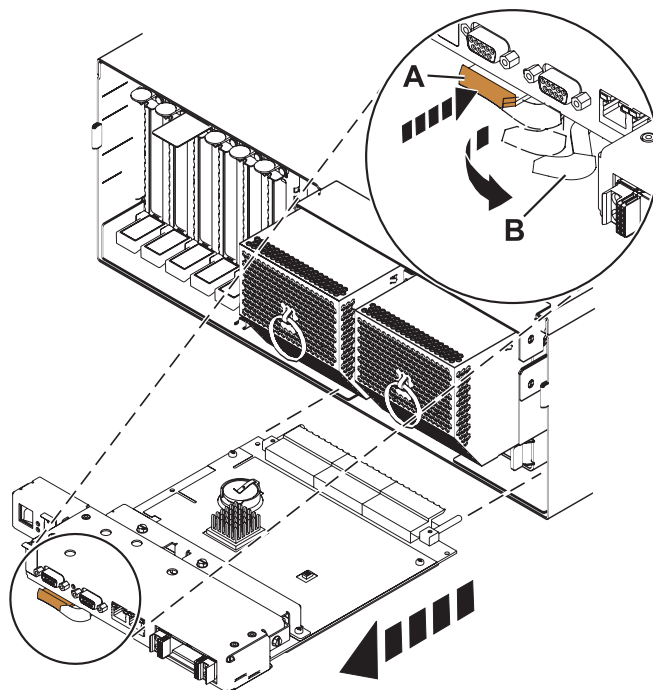
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



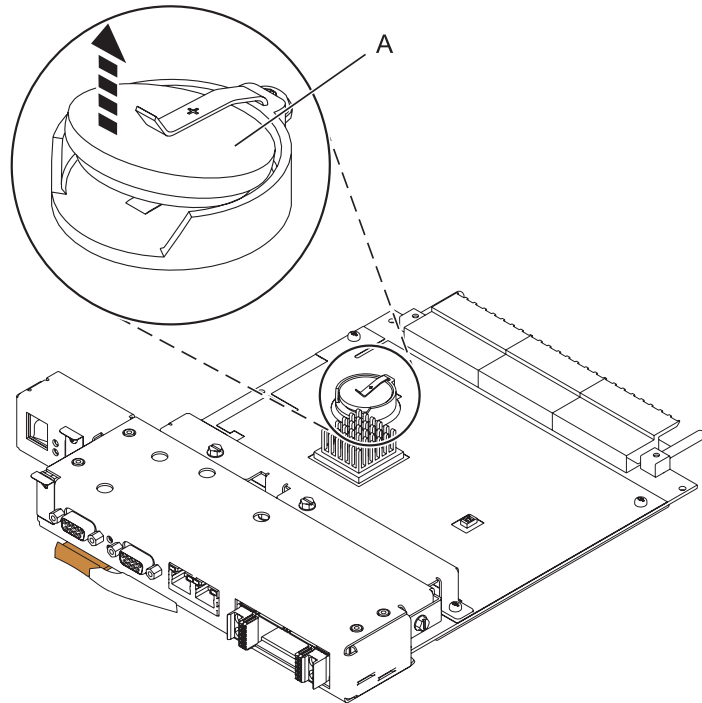
3. Remove the Service Processor Assembly

1. Label and disconnect all cables connected to the service processor assembly.
2. Press the thumb release **(A)** on the service processor assembly to unlock the handle.
3. Pull the handle to the right to unseat the service processor assembly.
4. Pull the service processor assembly from the card enclosure using the handle and supporting the bottom of the card.



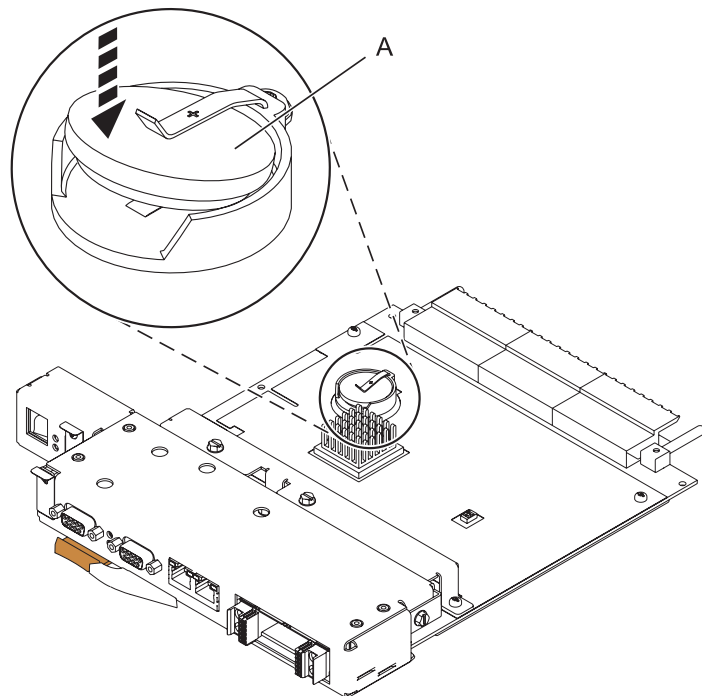
4. Remove the Time-Of-Day Battery

Remove the time-of-day battery **(A)** from its slot as shown.



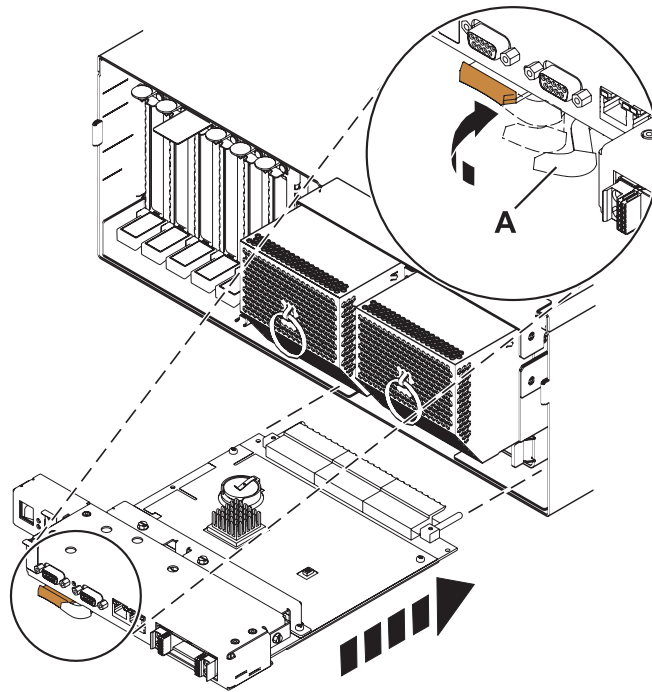
5. Install the Time-Of-Day Battery

If a time-of-day battery **(A)** is not present, install one in the new service processor assembly.



6. Install the Service Processor Assembly

1. Align the service processor assembly with the card slot.
2. Slide the service processor assembly all the way into the card slot in the card enclosure.
3. Push the handle **(A)** towards the service processor assembly until the release tab locks the handle in place. This will secure the service processor assembly into the card slot.
4. Reconnect all service processor assembly cables.

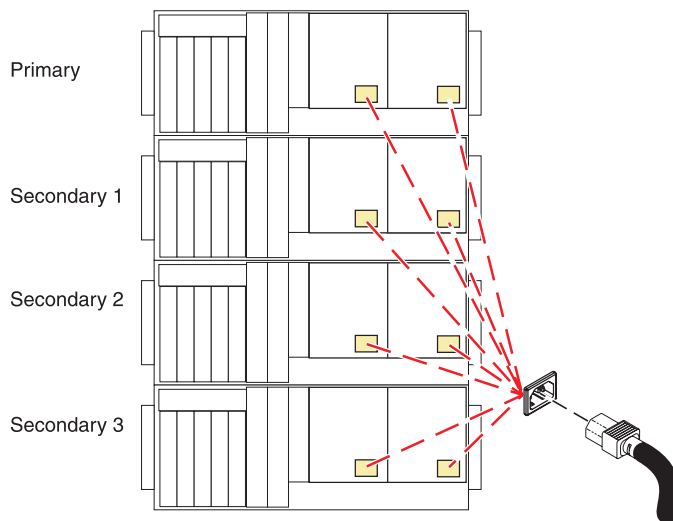


7. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



8. Restore Network Connectivity

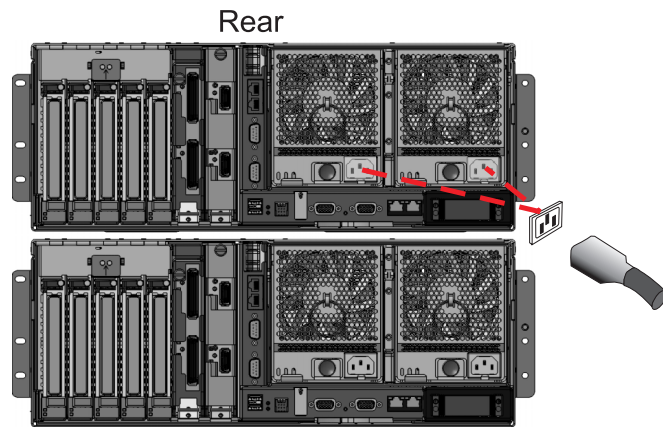
The installed Service Processor must connect to the network to be accessible from the HMC.

How will the IP Address of the Service Processor be managed?

Configure a static IP Address	Obtain an IP Address automatically from a DHCP server
↓	Go to step 15 on page 556

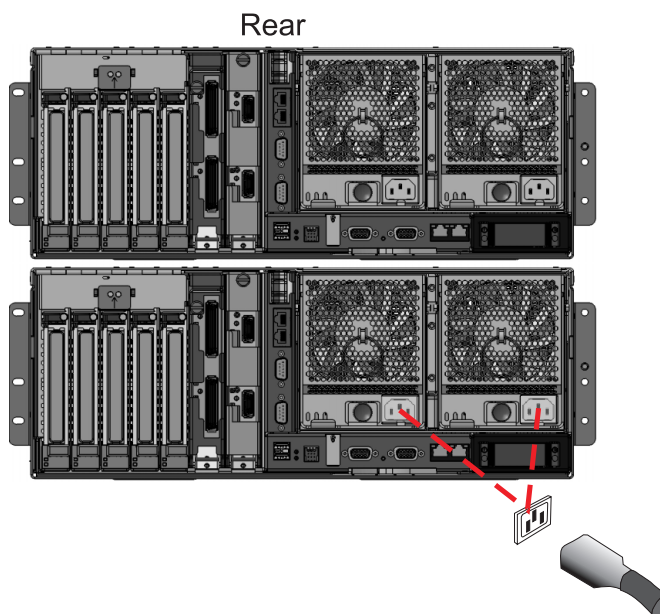
9. Plug In Top Enclosure

Connect the AC power source to the top enclosure.



10. Plug In Second Enclosure

Connect the AC power source to the second enclosure.



11. To configure the PC or mobile computer to access ASMI:

The Advanced System Management Interface (ASMI) will be used to configure the new Service Processor. A PC or mobile computer must be connected to the Service Processor to access ASMI.

To configure the PC or mobile computer to access ASMI

1. Connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC1, or the Ethernet port labeled HMC2 on the Service Processor being serviced.
2. Configure the Ethernet interface on the PC or mobile computer to an IP address and subnet mask within the same subnet as the server, so that your PC or mobile computer can communicate with the Service Processor.

Use the following table to help determine these values:

Service Processor connector	IP address	Subnet mask	Gateway address
HMC1	169.254.2.147	255.255.255.0	169.254.2.1
HMC2	169.254.3.147	255.255.255.0	169.254.3.1

For example, if you connected your PC or mobile computer to HMC1, the IP address for your PC or mobile computer could be 169.254.2.1 and the subnet mask would be 255.255.255.0. Set the gateway IP address to the same IP address as the PC or mobile computer.

12. To connect to the ASMI:

To configure the Service Processor you must connect to the Advanced System Management Interface (ASMI).

To connect to the ASMI

1. Type the ASMI address in the Address field of your PC's or mobile computer's Web browser.
2. When the login display appears, enter one of the following default user IDs and passwords:

User ID	Password
admin	admin

3. Change the default password when prompted

13. To configure the Service Processor's static IP Address:

Configure the Service Processor's static IP Address.

To configure the Service Processor's static IP Address

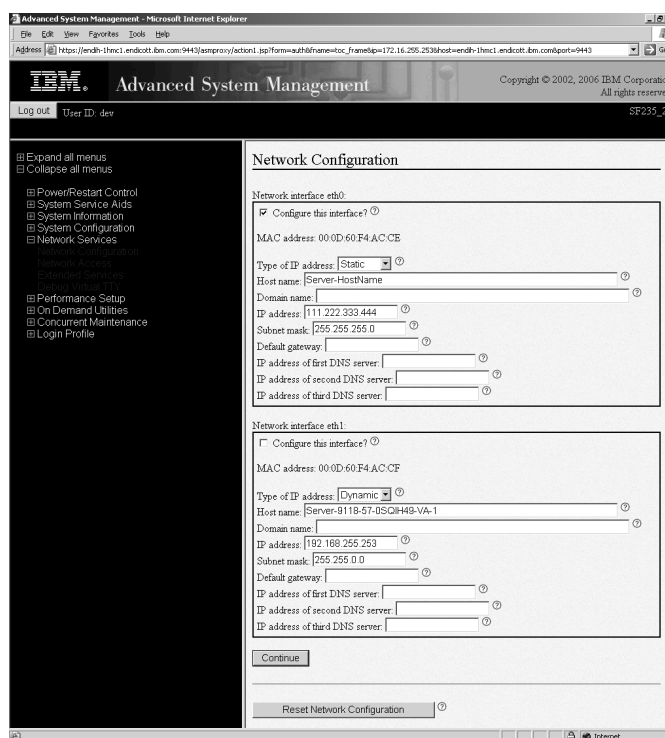
1. From the navigation area, expand Network Services.
2. Click Network Configuration.
3. If your service processor connects to the network using a static IP address on Ethernet port HMC1, fill in the section labeled Network interface eth0.

If your service processor connects to the network using a static IP address on Ethernet port HMC2, fill in the section labeled Network interface eth1.

4. Ensure that the following fields are filled in correctly:

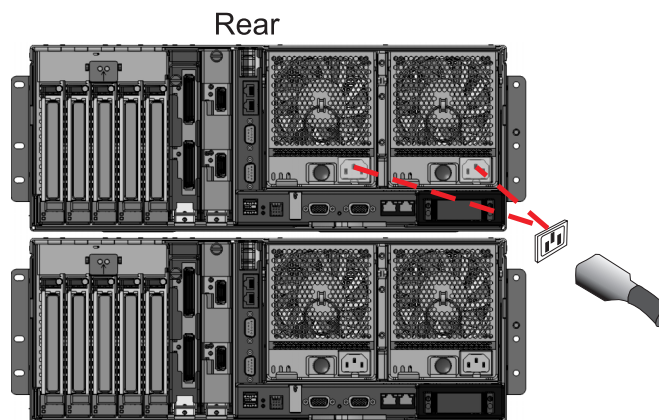
Field	Value
Configure this interface?	Yes
Type of IP address	Static
IP address	The service Processor's static IP address
Subnet mask	255.255.255.0

5. Click **Continue** and verify your settings on the Network Configuration panel.
6. Click **Save Settings** to complete the static IP Address configuration.



14. Unplug service processor enclosure

Disconnect the AC power source from the enclosure.



15. If necessary, move the op panel.

Does the op panel need to be moved?

Yes

No

↓

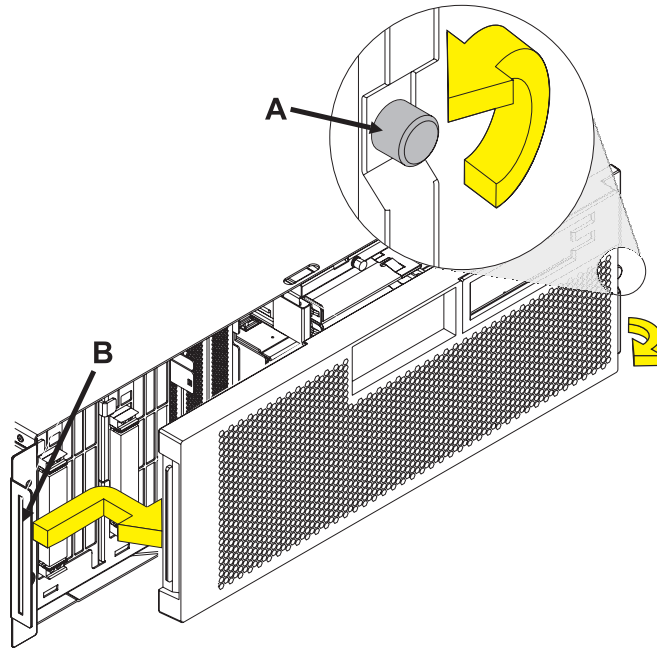
Go to step 20 on page 558.

16. Remove the front covers from both drawers containing the redundant service processors.

To remove:

1. Unlock the cover.
2. Grasp the edges of the right side **(A)** and pull it towards you to open it.
3. After opening the cover, press down on the lever **(B)** that is located inside along the top, left side of the cover.
4. Tilt the top of the cover away from the tower and lift the cover off.

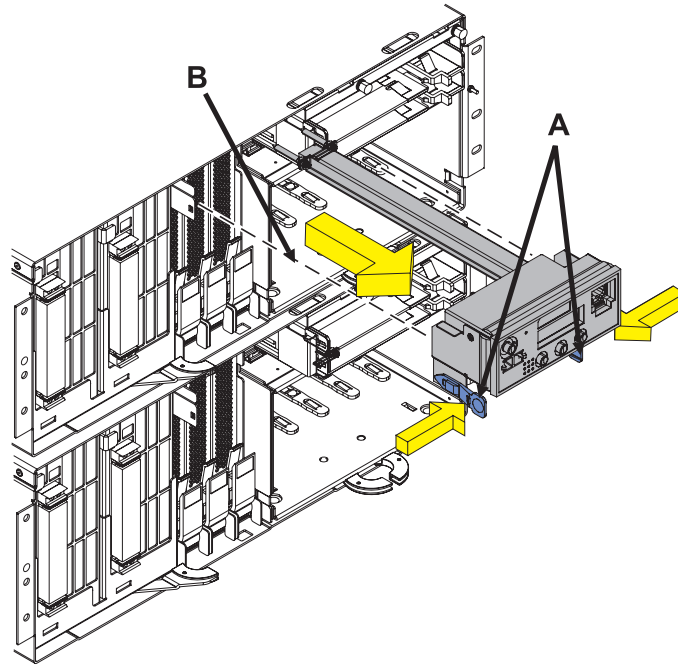
When you have completed these steps for both drawers, click **Next** to continue.



17. Remove the Control Panel

Remove the control panel from the top drawer by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges of the panel, and pulling it out of its bay **(B)**.

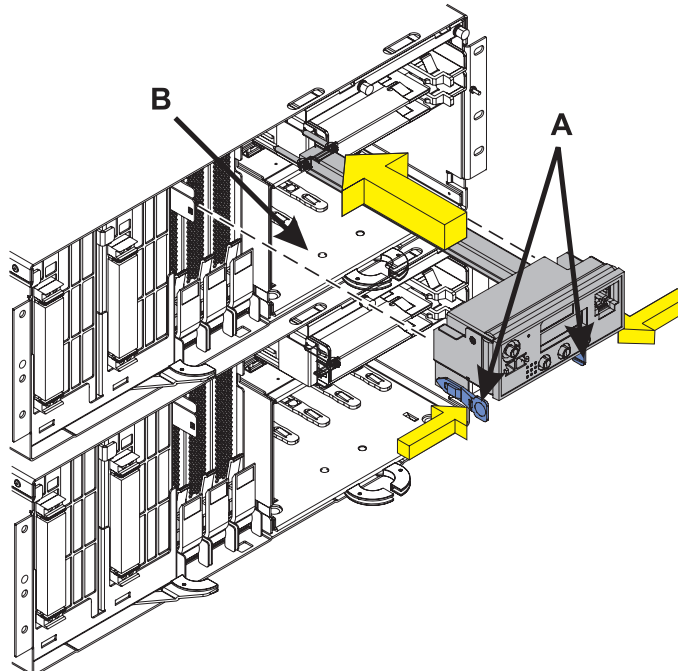
Attention: A control panel or control panel filler must be in place when the system is on for proper air flow and cooling.



18. Install the Control Panel

Install the control panel in the top drawer by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges of the panel, and pulling it out of its bay **(B)**.

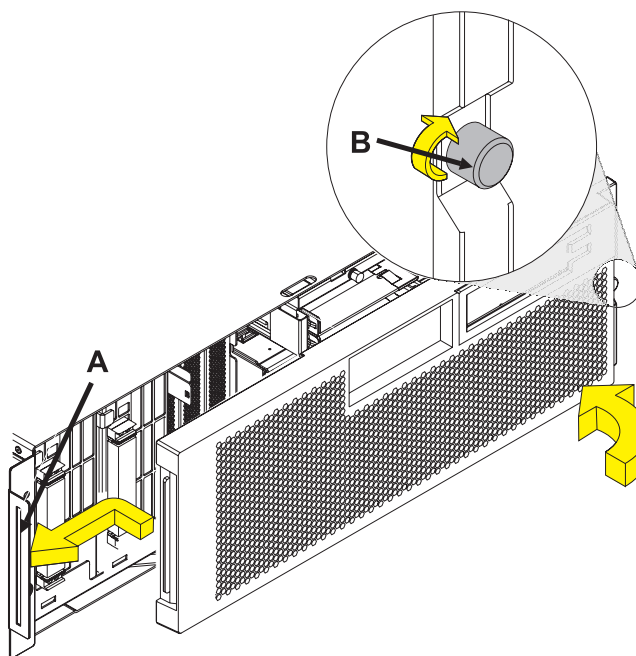
Attention: A control panel or control panel filler must be in place when the system is on for proper air flow and cooling.



19. Install the front covers on both drawers containing the redundant service processors

To install:

1. Tilt the top of the cover towards you while inserting the lower corner pin **(A)** into the lower hole in the cover.
2. Tilt the top of the cover towards the tower until the spring loaded upper pin **(B)** seats into the upper hole in the enclosure.
3. Grasp the right side of the cover and push it towards the frame to close it.

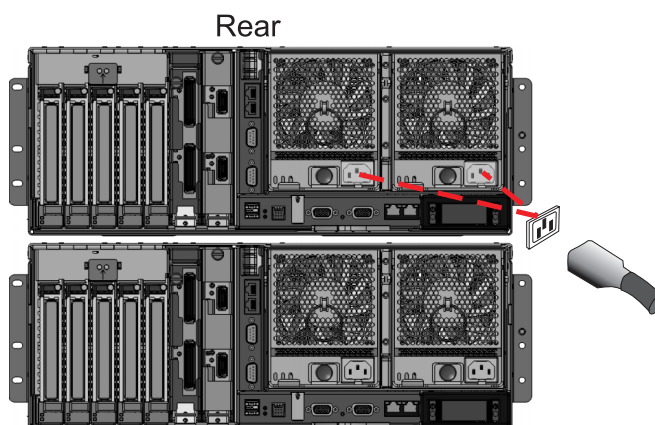


20. Power on both enclosures.

Using the next two steps, power on both enclosures. First, power on the primary enclosure, the enclosure you did not replace. Second, power on the secondary enclosure, the one you replaced. After powering on the primary enclosure, wait for a connection before powering on the secondary.

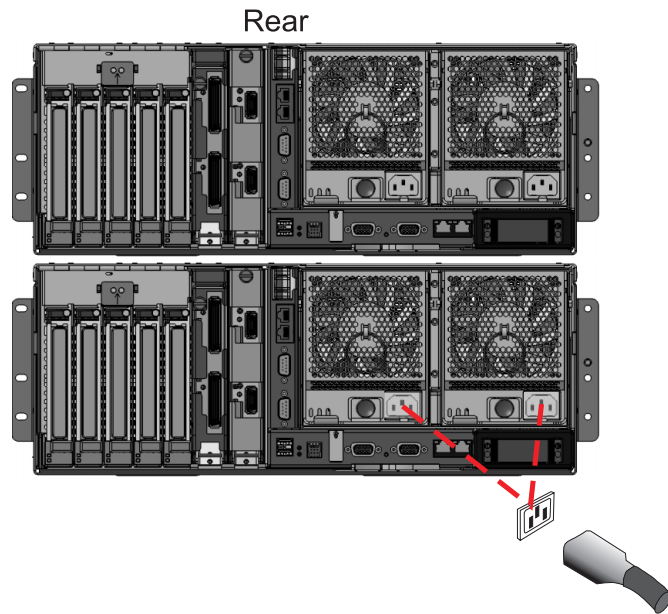
21. Plug In Top Enclosure

Connect the AC power source to the top enclosure.



22. Plug In Second Enclosure

Connect the AC power source to the second enclosure.



23.

Note: If you can not access the ASMI, or if the system will not power-on, after exchanging a service processor assembly, you might have a server firmware level problem. If the new service processor assembly contains an earlier release of server firmware than you were using, it might not support your current hardware configuration. You will need to update your server firmware using the USB port on the service processor assembly. Refer to *Service Guide for the Hardware Management Console Models 7042-CR4, 7042-C06 and 7042-C07, SA76-0120*.

24.

Verify the repair.

Go to Chapter 5, "Verifying a repair," on page 611.

Service processor cable

Use this information to replace the service processor cable.

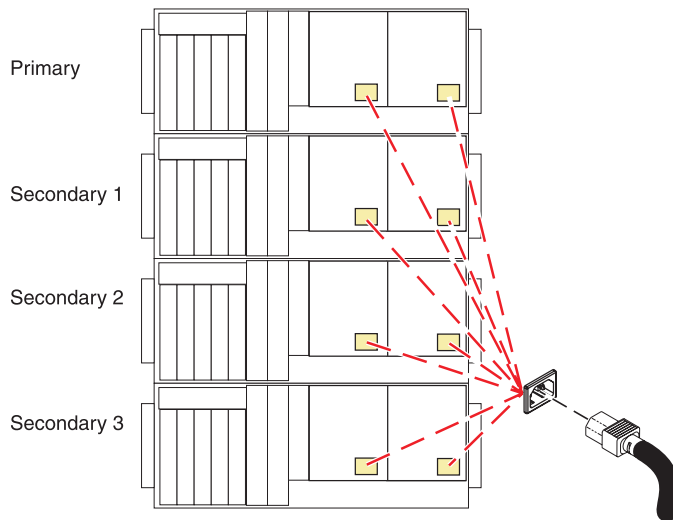
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

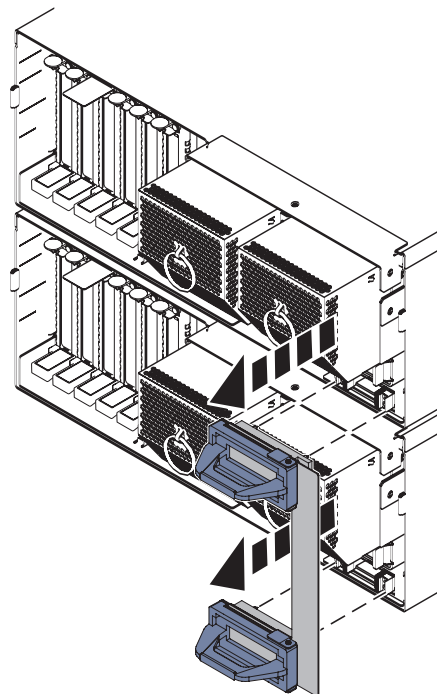
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



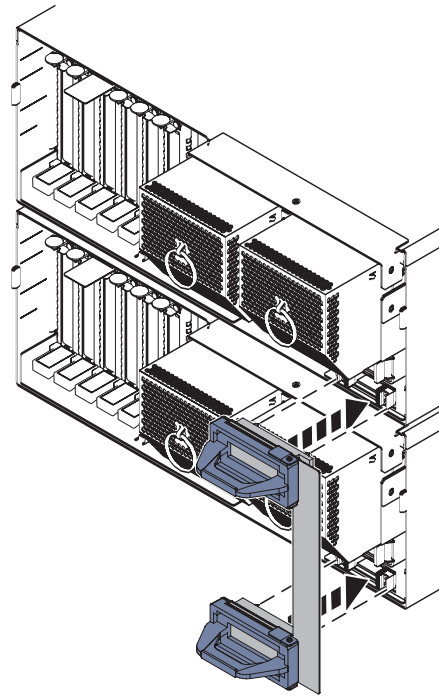
2. Remove the Service Processor Cable

1. Grasp the service processor cable handle on one system unit and pull it from the system unit.
2. Repeat the process for the other system unit.



3. Install the Service Processor Cable

1. Align the pins on the back of the service processor cable handle with the alignment holes on the back of one of the system units.
2. Using the handle, push the cable connector in place.
3. Repeat the process for the other system unit.

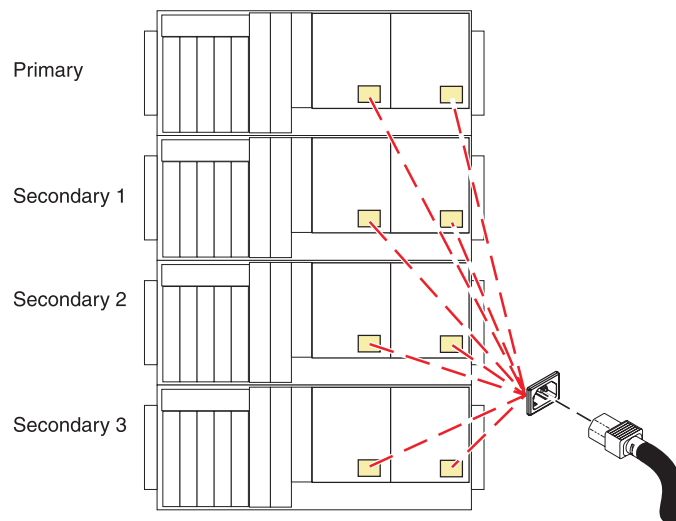


4. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



5. Verify the repair

Go to Chapter 5, "Verifying a repair," on page 611.

SMP cable

Use this information to replace the SMP cable.

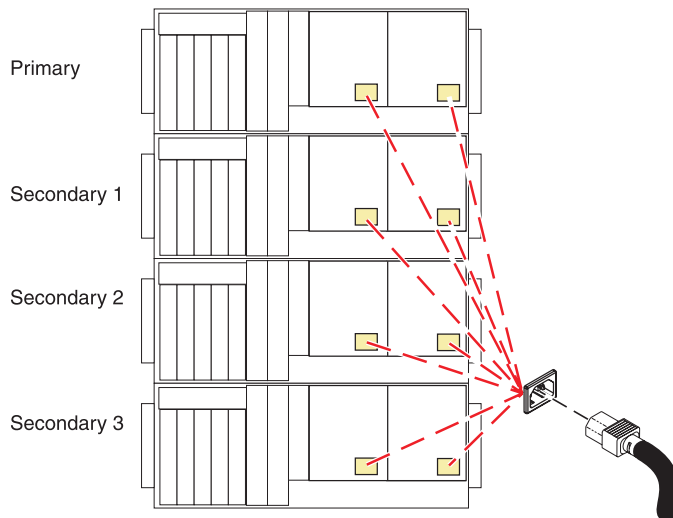
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

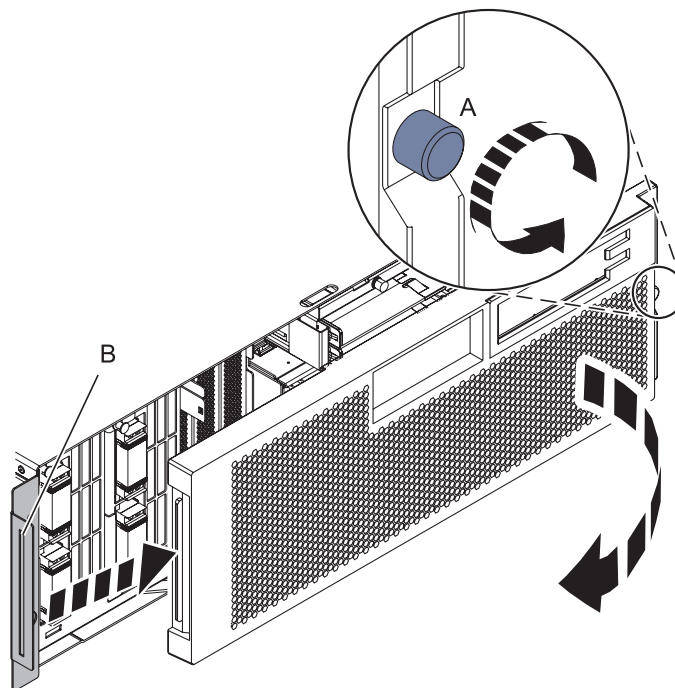
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



2. Remove the Front Cover

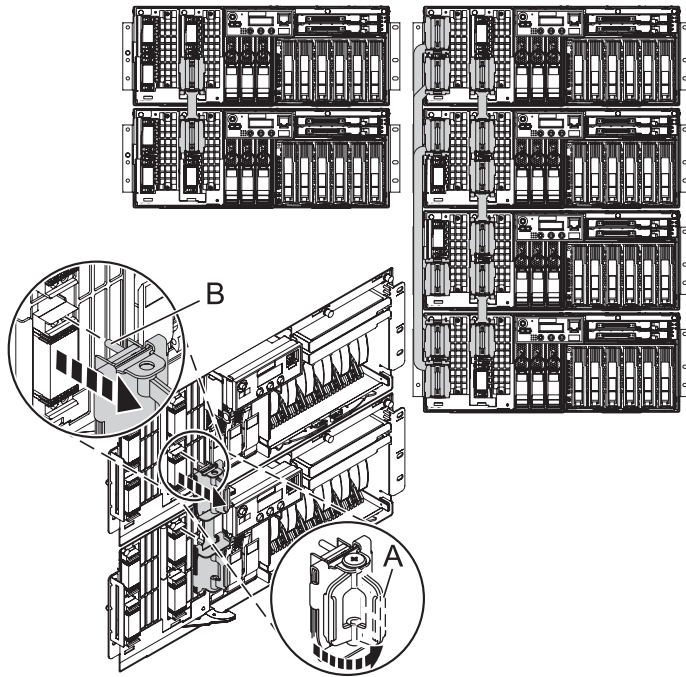
1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



3. Remove SMP Cable

Beginning with the SMP processor cable connection to the lowest system unit in the rack, and moving up to the SMP processor cable connection to the highest system unit in the rack, perform the following for each rack:

1. Carefully pull the handle **(A)** from the system until the connector is unseated.
2. When the guide pins **(B)** are free, carefully pull the SMP processor cable away from the system unit.
3. Carefully pull the cable away from the rack and set it aside.

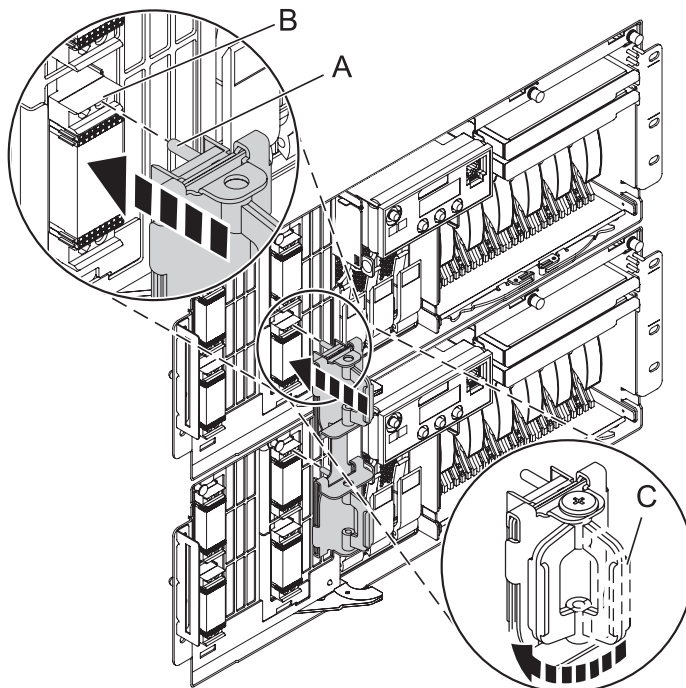


4. Install SMP Cable

Place the SMP processor cable into position over the system units so that the connectors on the cable align with the processor cards in each unit.

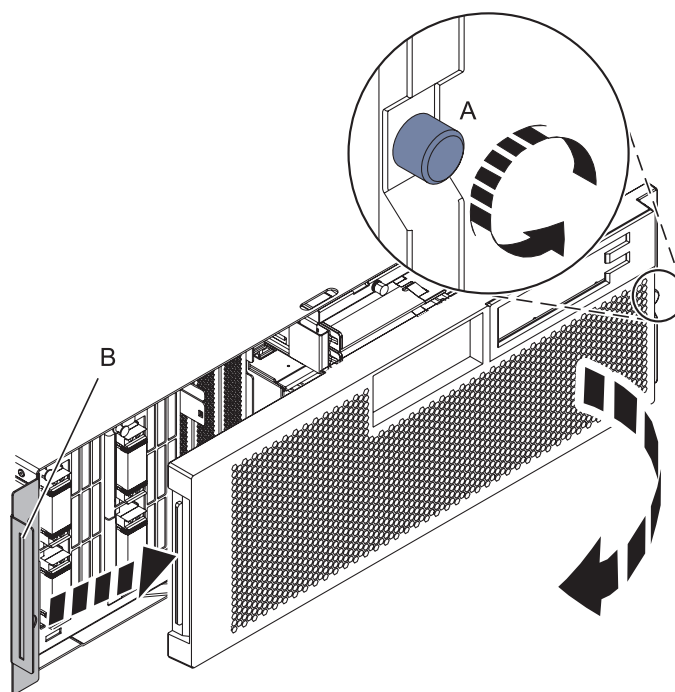
Beginning with the topmost SMP cable connection and continuing downward, perform the following for each rack:

1. Align the guide pins **(A)** with the connectors **(B)** on the system unit.
2. Using the handle **(C)**, carefully push the SMP processor cable into the system unit connector.



5. Install the Front Cover

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.

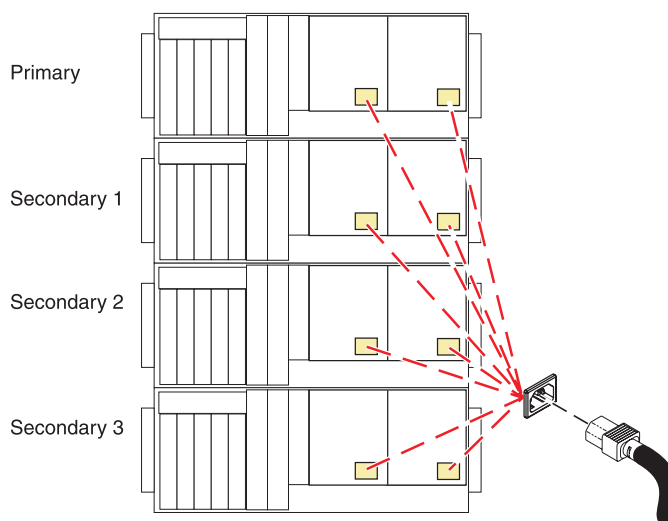


6. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



7. Verify the repair

Go to Chapter 5, "Verifying a repair," on page 611.

System backplane

Use this procedure to service a system backplane.

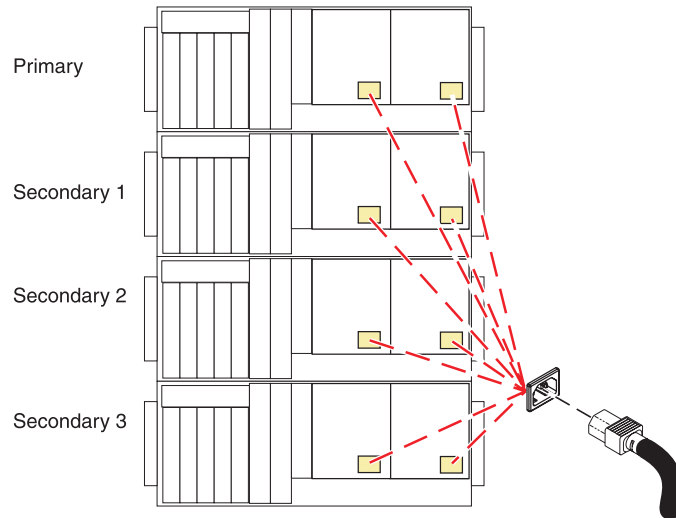
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

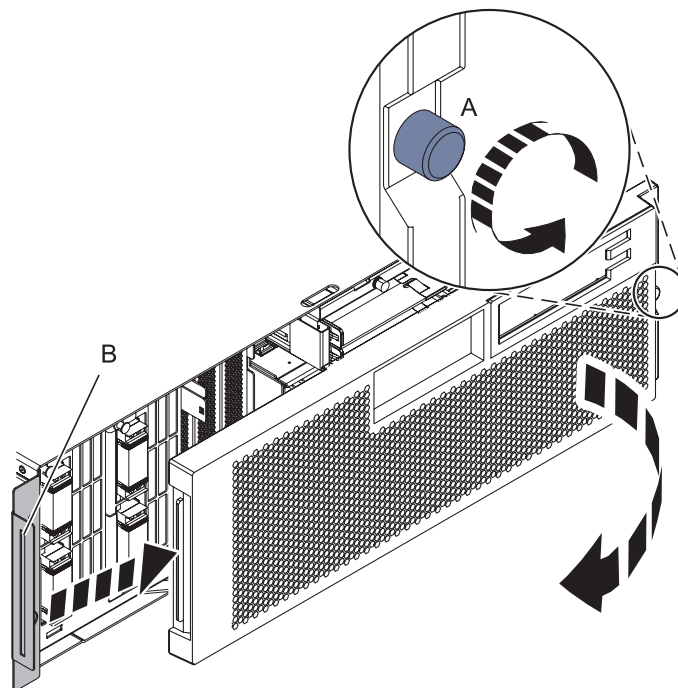
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



2. Remove the Front Cover

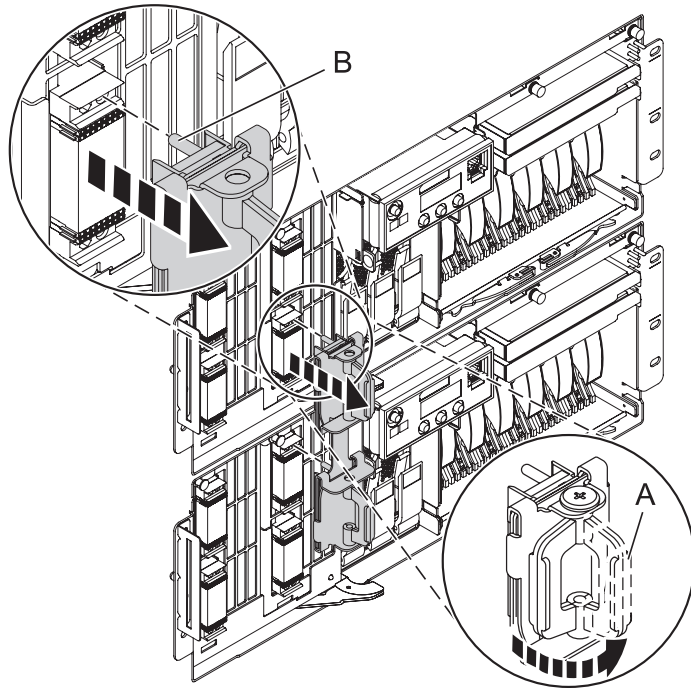
1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



3. Disconnect SMP Cable

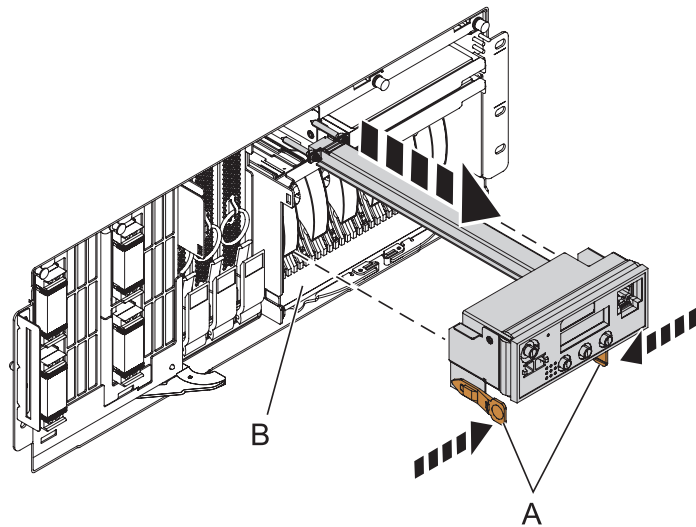
1. Carefully pull the handle **(A)** from the system until the connector is unseated.
2. When the guide pins **(B)** are free, carefully pull the SMP processor cable away from the system unit.

Repeat these steps for all SMP cable connectors that are present on the system you are servicing.



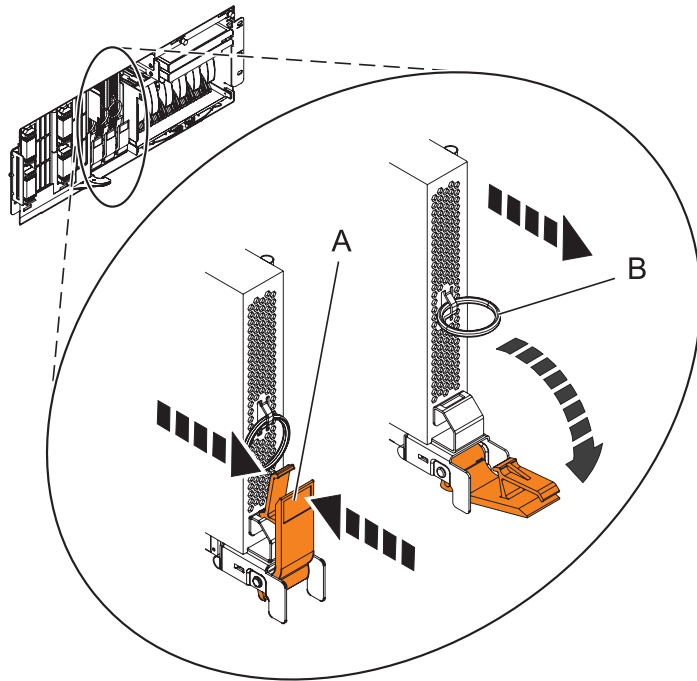
4. Remove the Control Panel or Control Panel Filler

In the enclosure you are servicing, remove the control panel or if present, control panel filler, by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges, and pulling it out of its bay **(B)**.



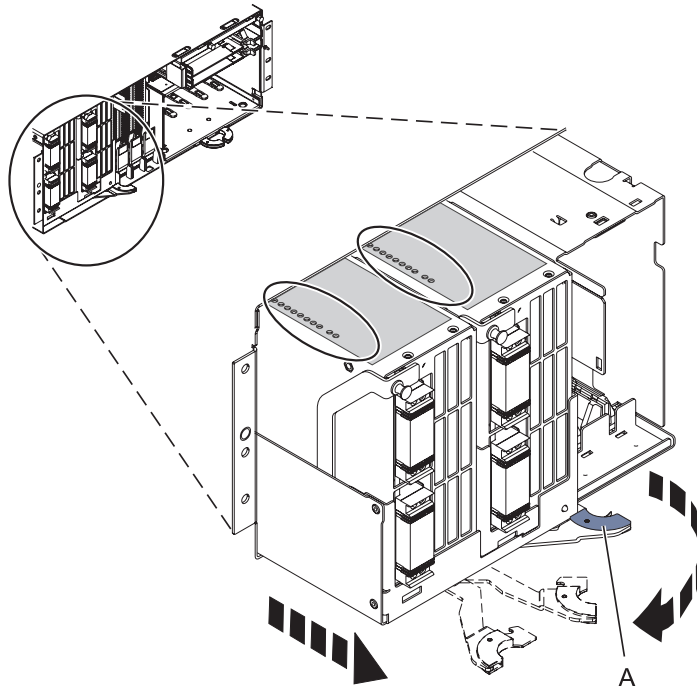
5. Remove the Voltage Regulator Assemblies

1. Squeeze the top of the latch **(A)** to release it, then rotate the latch out and then down.
2. Grasp the pull ring **(B)** and slowly pull the voltage regulator out of the enclosure.
NOTE: Pulling the voltage regulator assembly out of the card enclosure requires a large amount of force. The voltage regulator assembly is of substantial weight, so grasp it firmly when it is free of the card enclosure.
3. Repeat these steps until all voltage regulator assemblies have been removed.



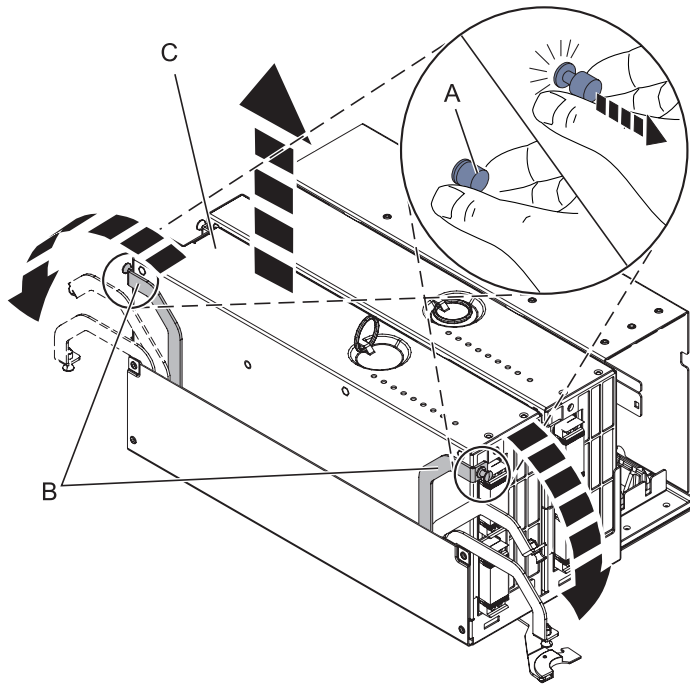
6. Remove the System Backplane Assembly

1. Push the blue lever to the left and out from the system **(A)** to unlock the system backplane assembly.
2. Pull the system backplane assembly out of the system using both hands.
ATTENTION: The system backplane assembly weighs 35 lbs and should not be pulled out using the blue lever. Grasp the backplane assembly firmly with both hands when it is free of the system.



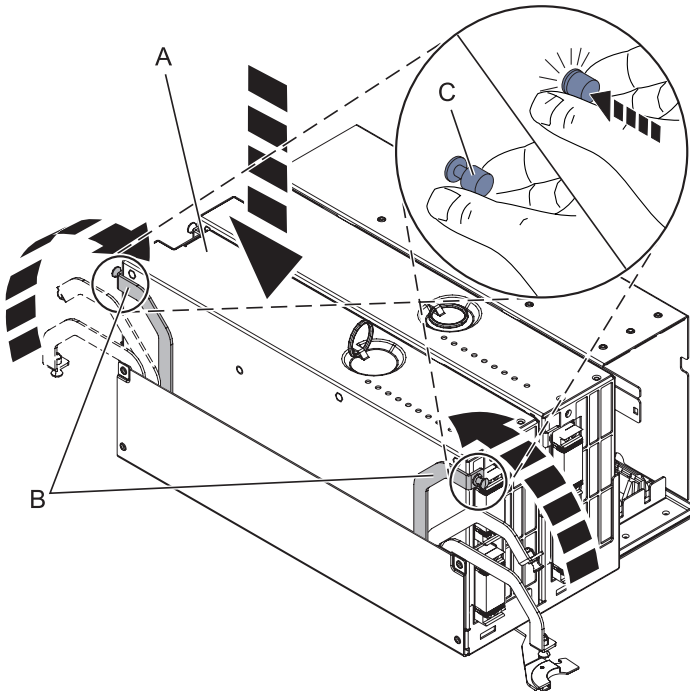
7. Remove all Processor Assemblies or Fillers

1. Pull the locking knobs out **(A)** to the unlocked position.
2. Push the locking arms down and out **(B)** to unlock the system processor assembly.
3. Lift the system processor assembly out of the system backplane assembly **(C)**.
4. Remove all system processor assemblies (or fillers) from the system backplane assembly. Record the location of each system processor assembly being removed.



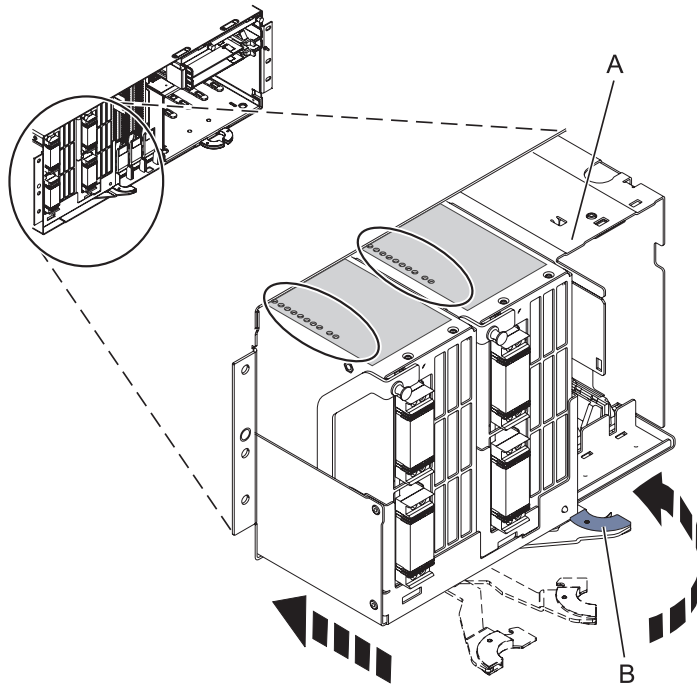
8. Install all Processor Assemblies or Fillers

1. Place the system processor assembly **(A)** into the new system backplane assembly using the location information that you recorded during the removal procedure.
2. Lock the system processor assembly into place with the locking arms **(B)**.
3. Press the locking knobs **(C)** in to the locked position.
4. Replace all system processor assemblies (or fillers) that were removed earlier.



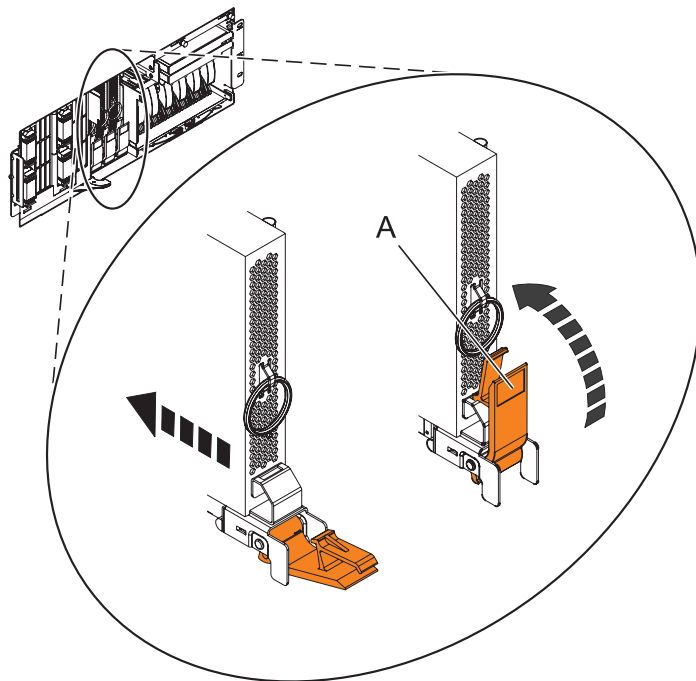
9. Install the new system backplane assembly

1. Align the system backplane assembly with the slot in the system.
2. Slide the system backplane assembly into the system **(A)**.
3. Push the blue lever **(B)** to the right and in toward the system to lock the system backplane assembly.



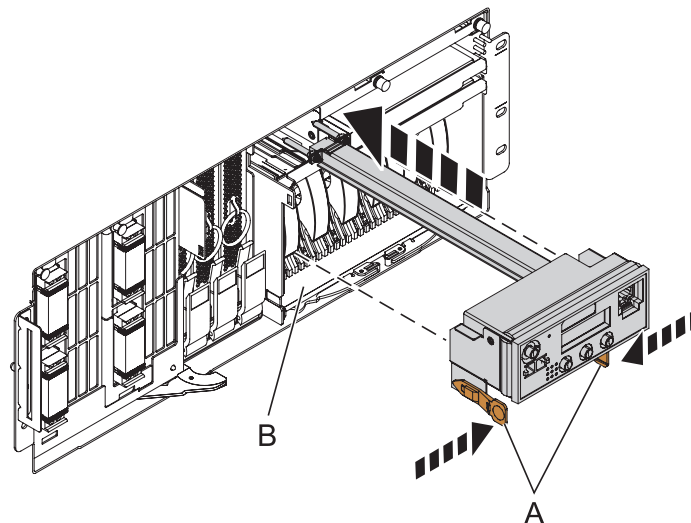
10. Install the Voltage Regulator Assemblies

1. Ensure that the voltage regulator assembly latch **(A)** is rotated out and down into the unlocked position.
2. Carefully grasp the voltage regulator assembly and slide it into the enclosure.
3. When the voltage regulator assembly is all the way into the card enclosure, rotate the latch **(A)** up into the locked position.
4. Repeat these steps until all voltage regulator assemblies have been installed.



11. Install the Control Panel or Control Panel Filler

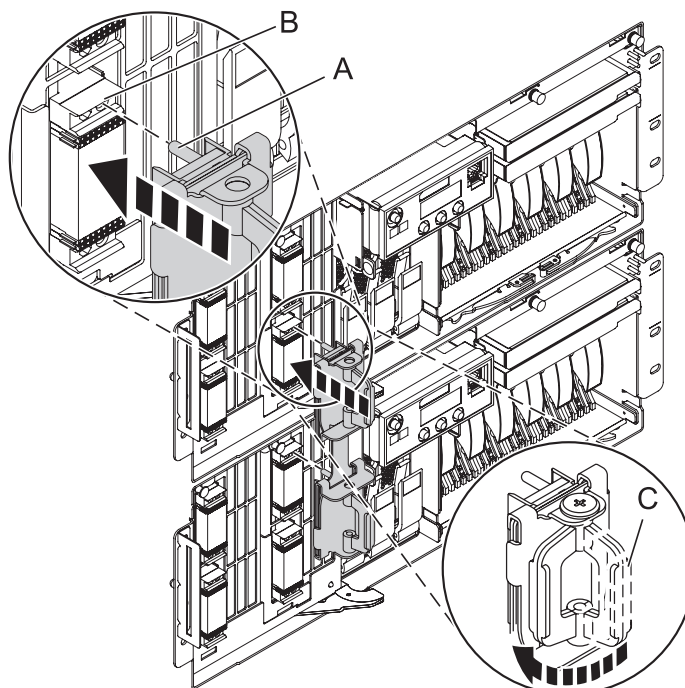
In the enclosure you are servicing, carefully slide the control panel or if present, control panel filler, into the control panel bay **(B)** until you feel the locking tabs **(A)** lock in place.



12. Connect SMP Cable

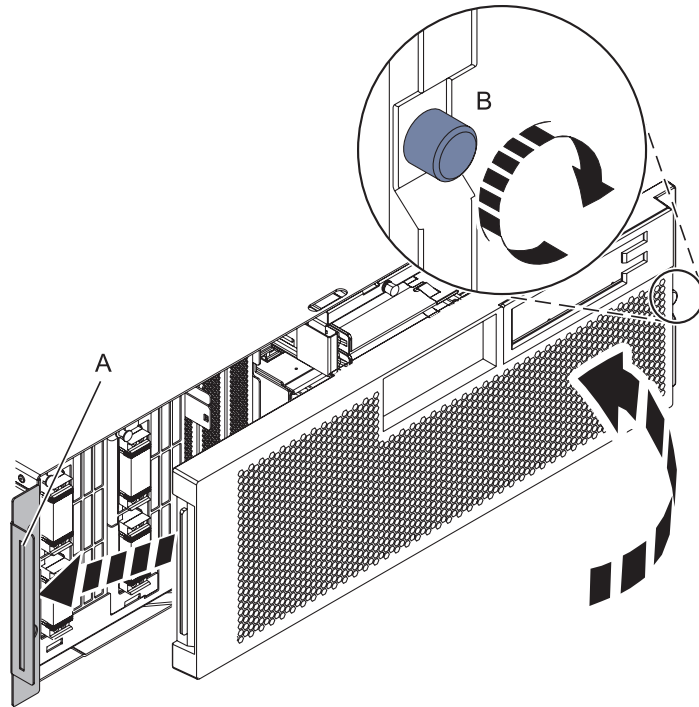
1. Align the guide pins **(A)** with the connectors **(B)** on the system unit.
2. Using the handle **(C)**, carefully push the SMP processor cable into the system unit connector.

Repeat these steps for all SMP cable connectors that are present on the system you are servicing.



13. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot **(A)** on the left side of the system unit.
2. Tighten the thumbscrew **(B)** on the right side of the cover.
3. Close the front rack door.

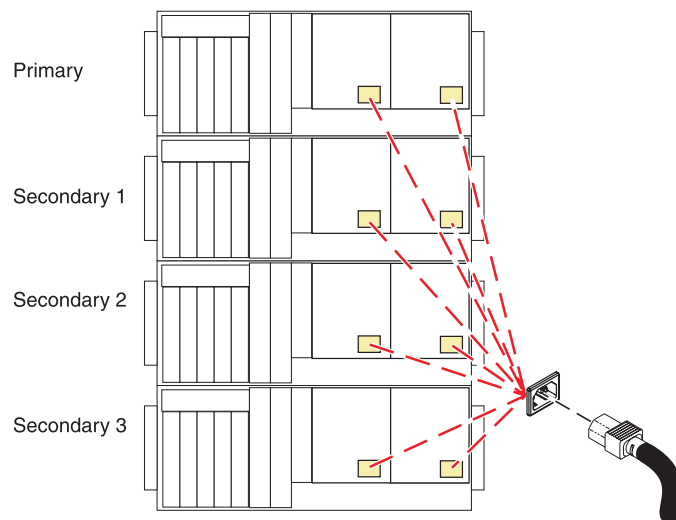


14. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



15. Verify the repair

Go to Chapter 5, "Verifying a repair," on page 611.

System processor assembly

Use this procedure to service a system processor assembly.

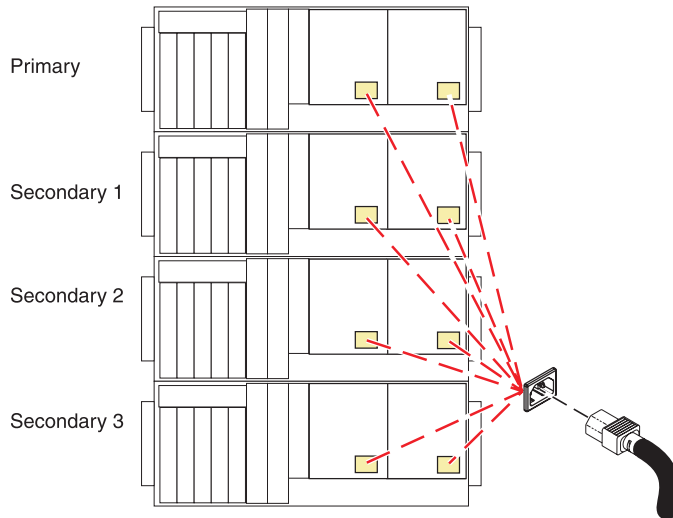
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

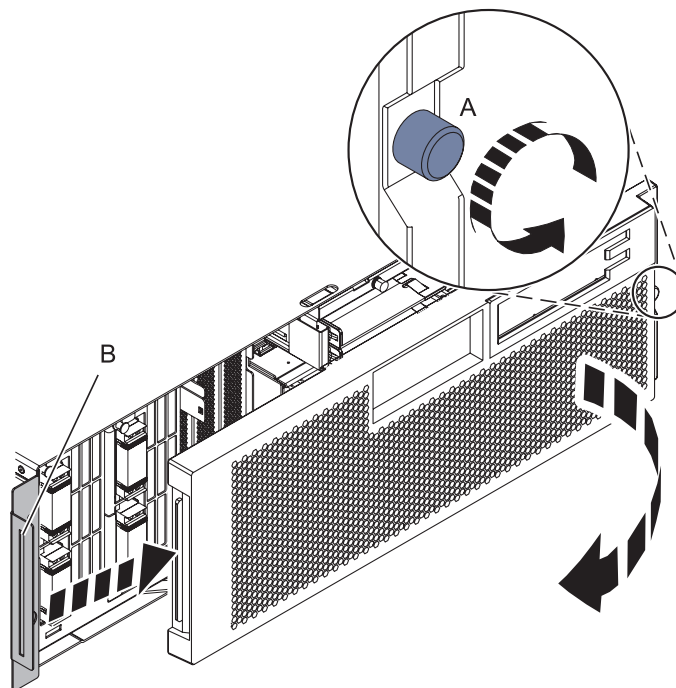
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



2. Remove the Front Cover

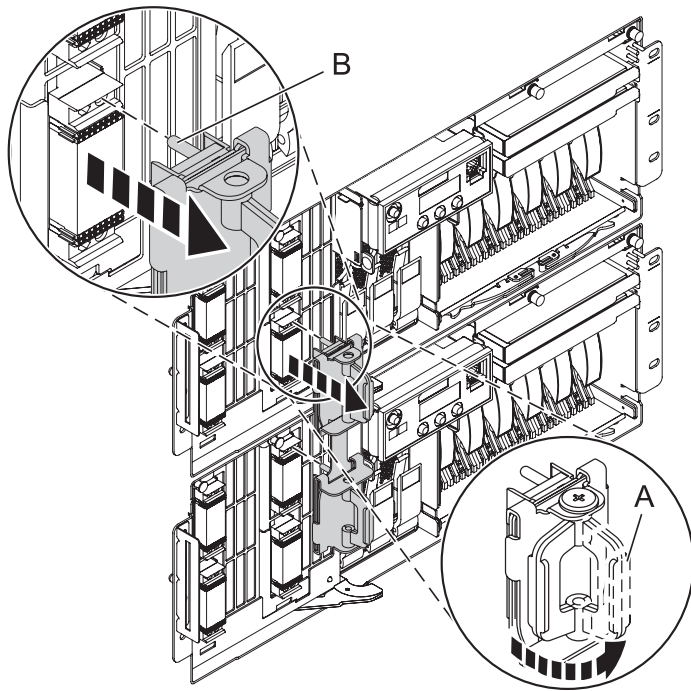
1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



3. Disconnect SMP Cable

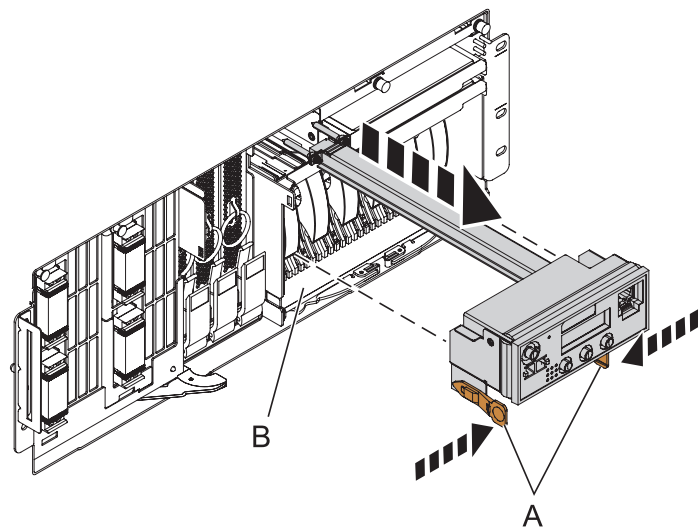
1. Carefully pull the handle **(A)** from the system until the connector is unseated.
2. When the guide pins **(B)** are free, carefully pull the SMP processor cable away from the system unit.

Repeat these steps for all SMP cable connectors that are present on the system you are servicing.



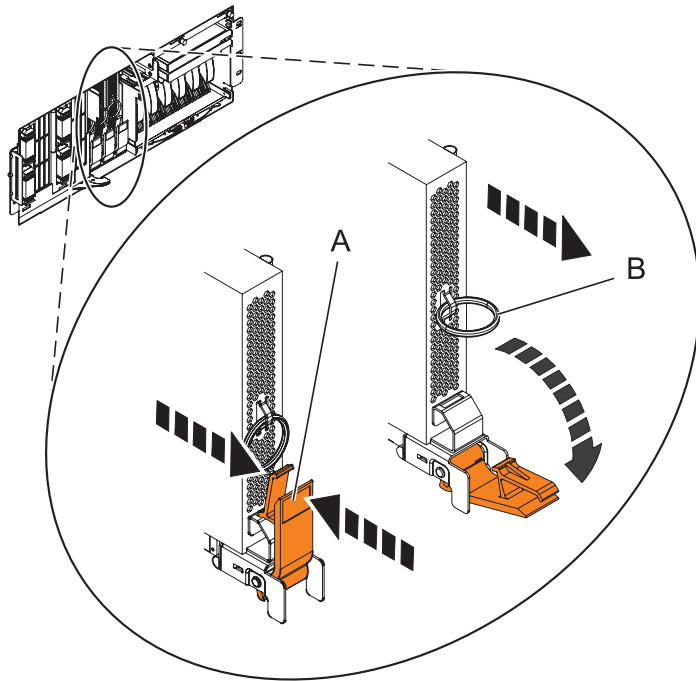
4. Remove the Control Panel or Control Panel Filler

In the enclosure you are servicing, remove the control panel or if present, control panel filler, by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges, and pulling it out of its bay **(B)**.



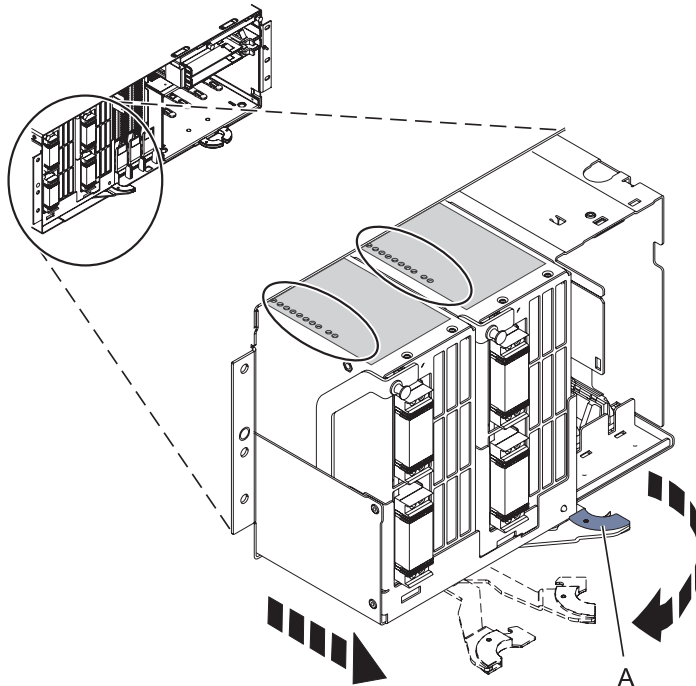
5. Remove the Voltage Regulator Assemblies

1. Squeeze the top of the latch **(A)** to release it, then rotate the latch out and then down.
2. Grasp the pull ring **(B)** and slowly pull the voltage regulator out of the enclosure.
NOTE: Pulling the voltage regulator assembly out of the card enclosure requires a large amount of force. The voltage regulator assembly is of substantial weight, so grasp it firmly when it is free of the card enclosure.
3. Repeat these steps until all voltage regulator assemblies have been removed.



6. Remove the System Backplane Assembly

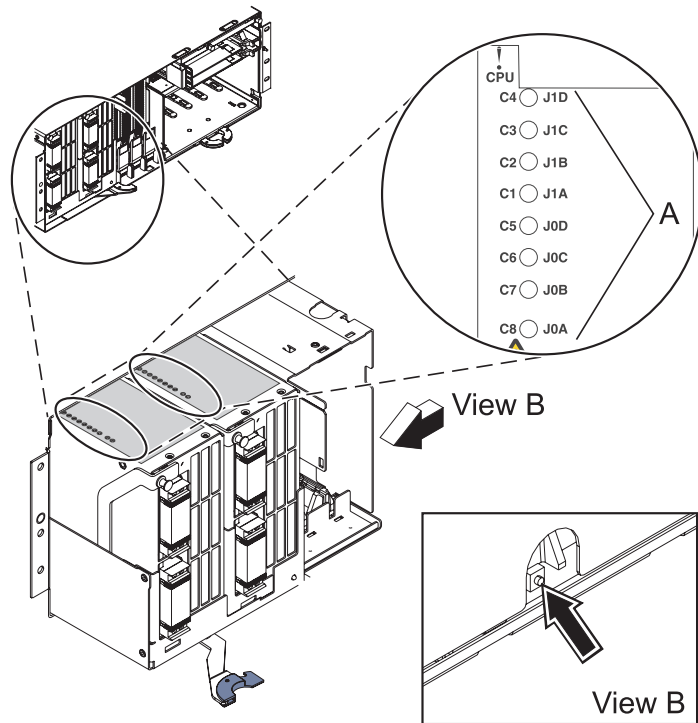
1. Push the blue lever to the left and out from the system **(A)** to unlock the system backplane assembly.
2. Pull the system backplane assembly out of the system using both hands.
ATTENTION: The system backplane assembly weighs 35 lbs and should not be pulled out using the blue lever. Grasp the backplane assembly firmly with both hands when it is free of the system.



7. Identify the Failing System Processor Assembly

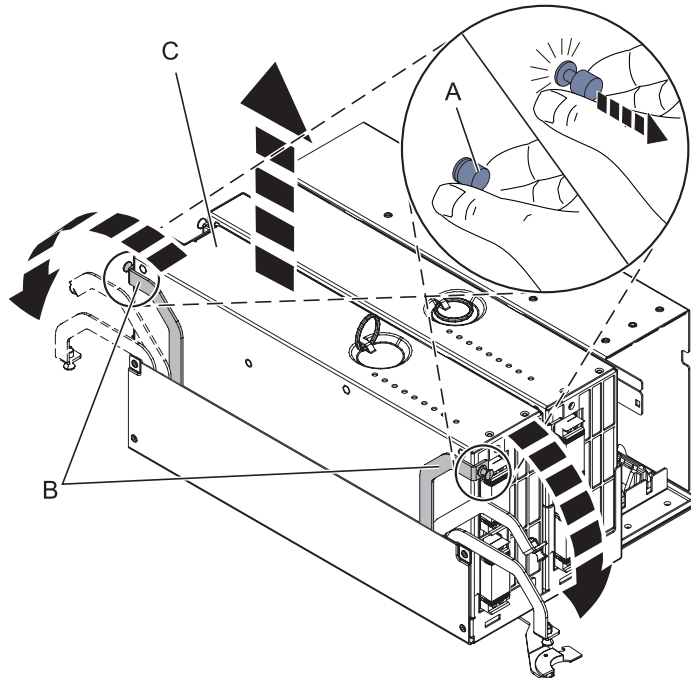
If you are removing the system backplane assembly because of a system failure, look at the LEDs **(A)** located on top of the system processor assemblies to identify the failing processor location. To illuminate the location LED for the failing processor, press the LED actuator button **(B)**.

ATTENTION: The actuator button must be used within 20 minutes after the system backplane assembly is removed from the system. The assembly retains the energy to light the LEDs for 40 seconds after the actuator button has been pressed.



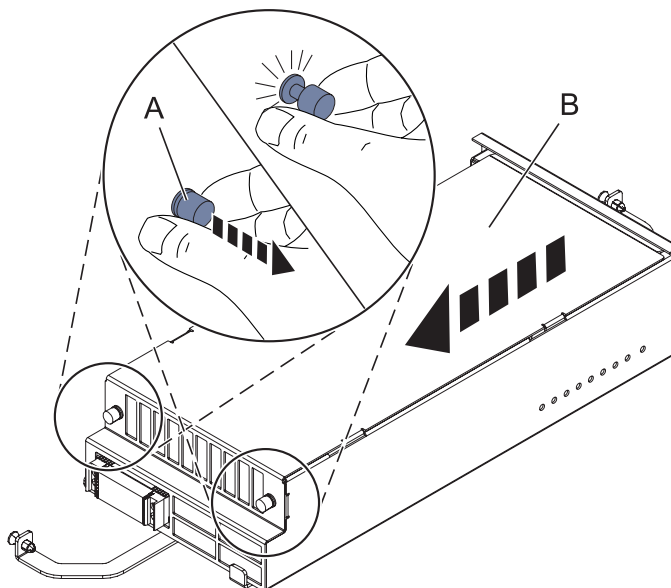
8. Remove the System Processor Assembly

1. Pull the locking knobs **(A)** out to the unlocked position.
2. Push the locking arms **(B)** down and out to unlock the processor card assembly.
3. Lift the processor card assembly **(C)** out of the system backplane assembly.



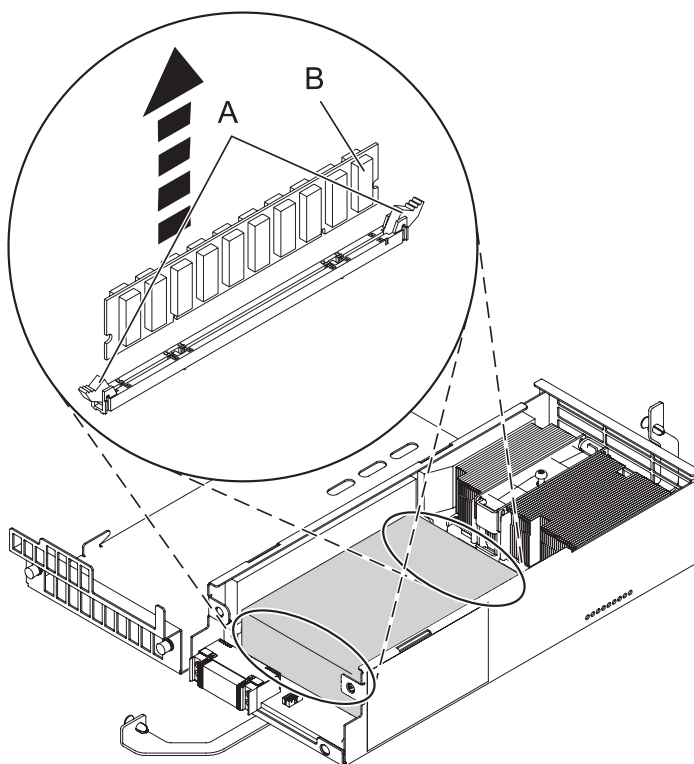
9. Remove the System Processor Assembly Cover

1. Unlock the two retaining knobs **(A)** on the system processor assembly.
2. Slide the cover **(B)** back.
3. Lift the cover off of the assembly.



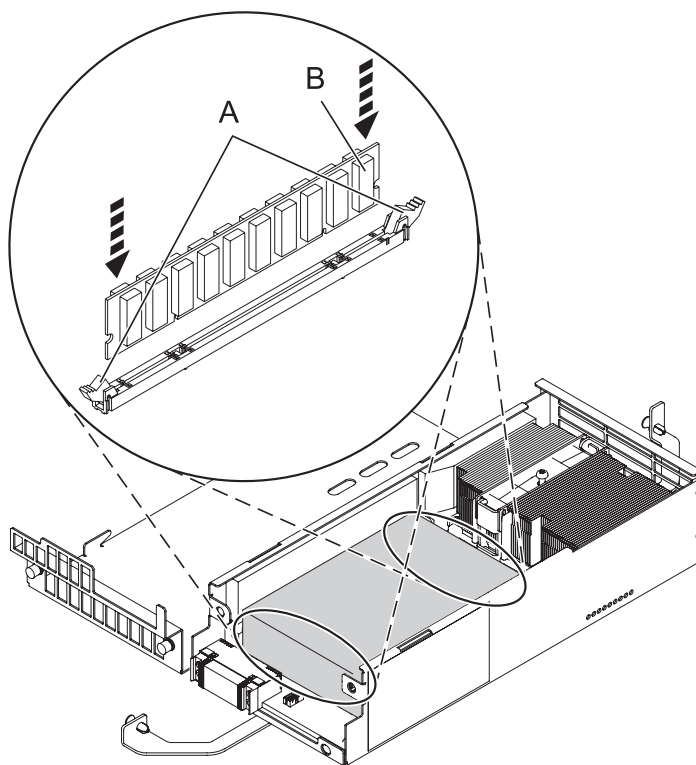
10. Remove all Memory DIMMs from the System Processor Assembly

1. If you are removing Tall DIMMs, remove the mylar cover, if installed, that is covering the memory DIMMS.
2. Unlock the memory DIMM by pushing the connector tabs **(A)** out and then down. The tabs' lever action forces the memory DIMM **(B)** out of the connector.
3. Lift the memory DIMM out of the processor assembly.
4. Label the memory DIMM according to its location.
5. Repeat these steps for the remaining memory DIMMs installed in this System Processor Assembly.



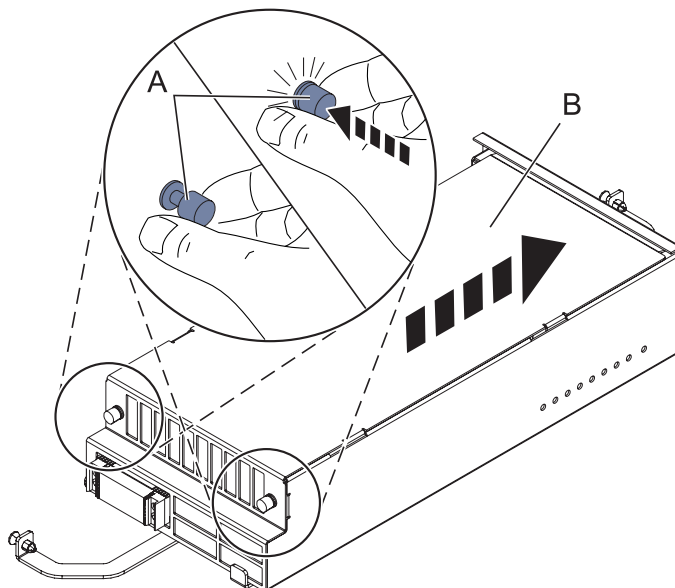
11. Install the Memory DIMMs in the new System Processor Assembly

1. Remove the cover of the new system processor assembly by unlocking the two retention knobs, pulling back and lifting up the cover.
2. Ensure that the connector locking tabs **(A)** are pushed out into the unlocked position before installing a memory DIMM.
3. Carefully grasp the memory DIMM **(B)** along two edges and align it with the connector. **ATTENTION:** System Processors are keyed to prevent a DIMM from being installed improperly. Note the locations of the key tabs within the DIMM connector before attempting to install the DIMM.
4. Push the memory DIMM firmly into the connector until the connector locking tabs engage.
5. Repeat these steps until all Memory DIMMs are installed.
6. If you are installing any Tall DIMMs, place the mylar cover over the DIMMs in the processor card to prevent the DIMMs from contacting the lid. **Note:** If you replace Tall DIMMs with regular-sized modules, remove the mylar cover. Failing to remove the mylar cover might restrict airflow in the unit.



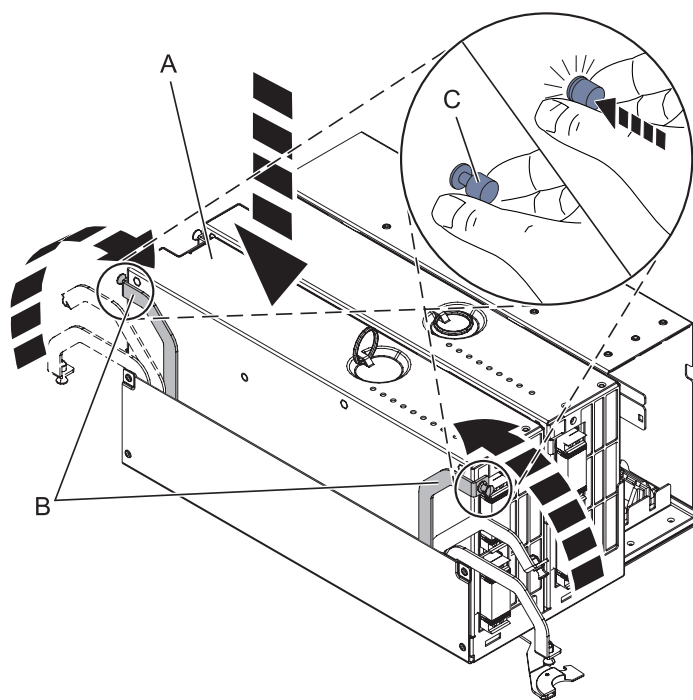
12. Install the System Processor Assembly Cover

1. Place the cover **(B)** on the system processor assembly.
2. Lock the two retention knobs **(A)**.



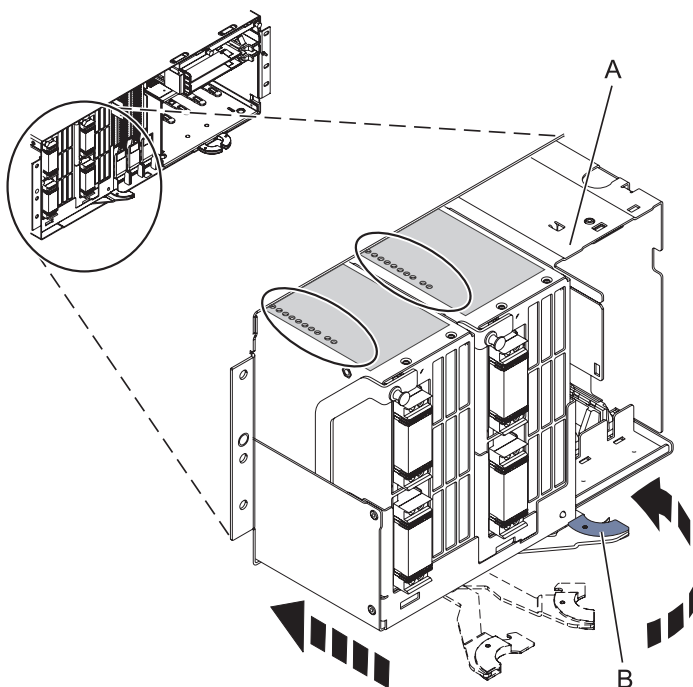
13. Install the System Processor Assembly

1. Place the processor assembly **(A)** into the system backplane assembly, and then lock it into place with the locking arms **(B)**.
2. Press the locking knobs **(C)** in to the locked position.



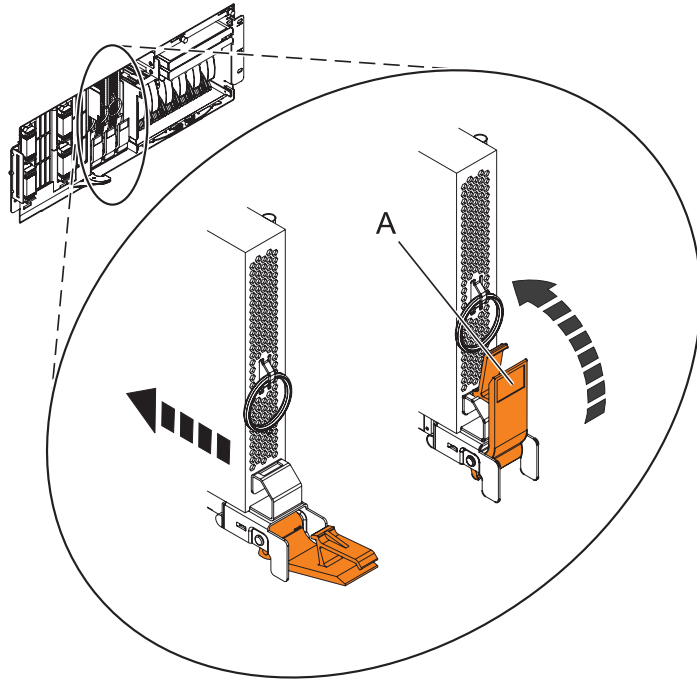
14. Install the System Backplane Assembly

1. Align the system backplane assembly with the slot in the system.
2. Slide the system backplane assembly into the system **(A)**.
3. Push the blue lever **(B)** to the right and in toward the system to lock the system backplane assembly.



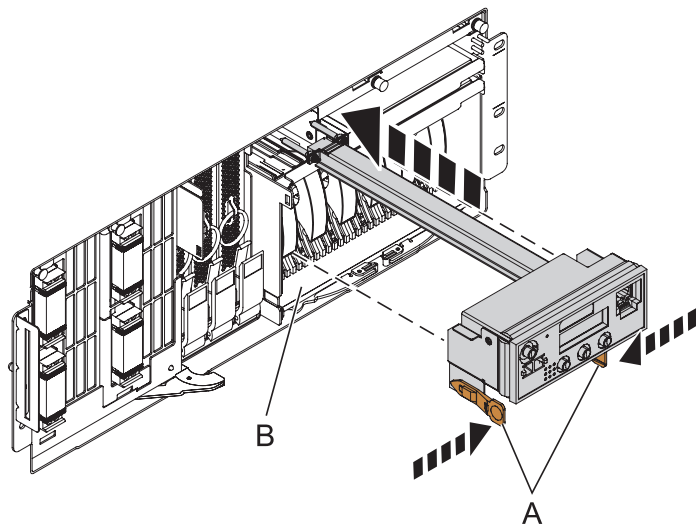
15. Install the Voltage Regulator Assemblies

1. Ensure that the voltage regulator assembly latch **(A)** is rotated out and down into the unlocked position.
2. Carefully grasp the voltage regulator assembly and slide it into the enclosure.
3. When the voltage regulator assembly is all the way into the card enclosure, rotate the latch **(A)** up into the locked position.
4. Repeat these steps until all voltage regulator assemblies have been installed.



16. Install the Control Panel or Control Panel Filler

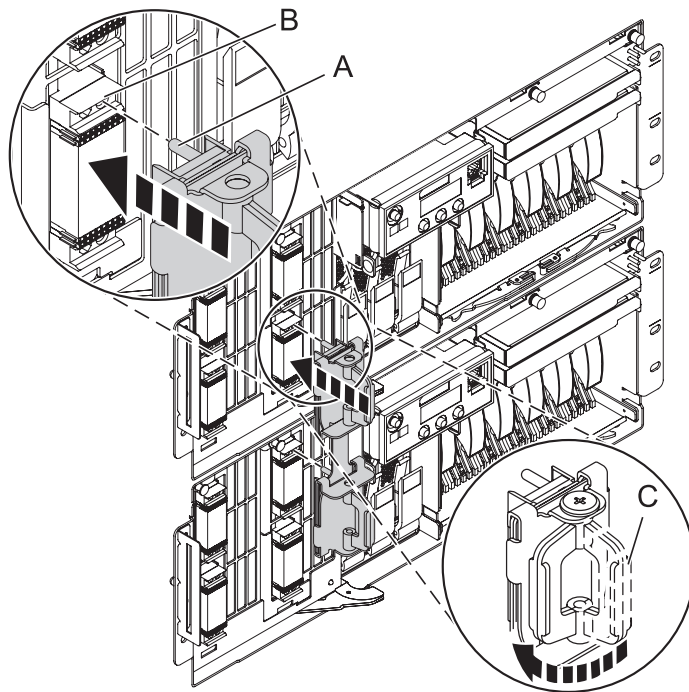
In the enclosure you are servicing, carefully slide the control panel or if present, control panel filler, into the control panel bay **(B)** until you feel the locking tabs **(A)** lock in place.



17. Connect SMP Cable

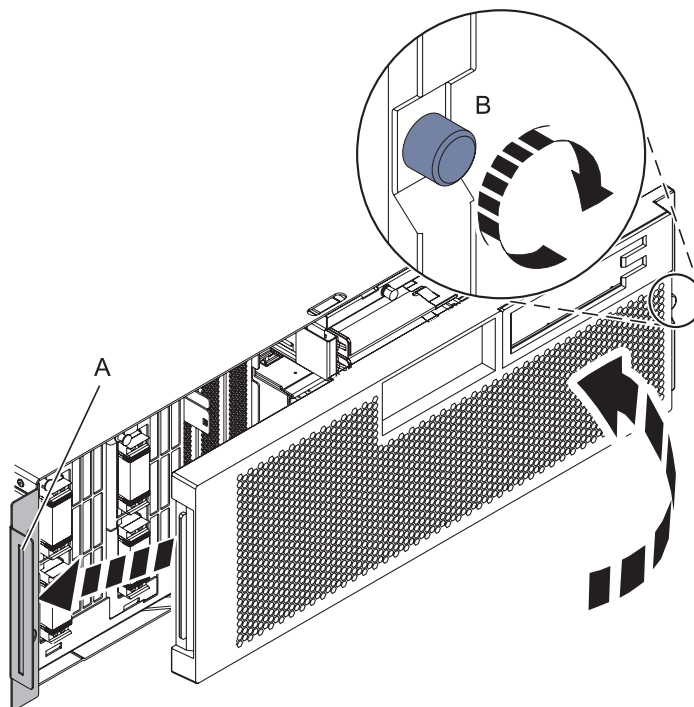
1. Align the guide pins **(A)** with the connectors **(B)** on the system unit.
2. Using the handle **(C)**, carefully push the SMP processor cable into the system unit connector.

Repeat these steps for all SMP cable connectors that are present on the system you are servicing.



18. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot **(A)** on the left side of the system unit.
2. Tighten the thumbscrew **(B)** on the right side of the cover.
3. Close the front rack door.

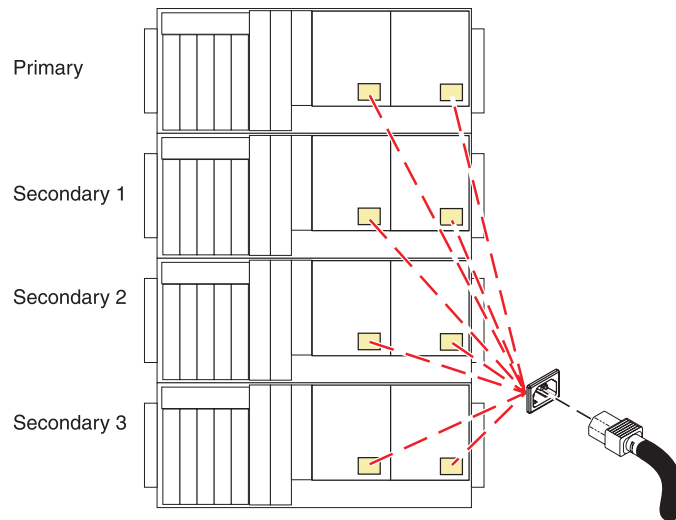


19. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



20. Verify the repair

Go to Chapter 5, “Verifying a repair,” on page 611.

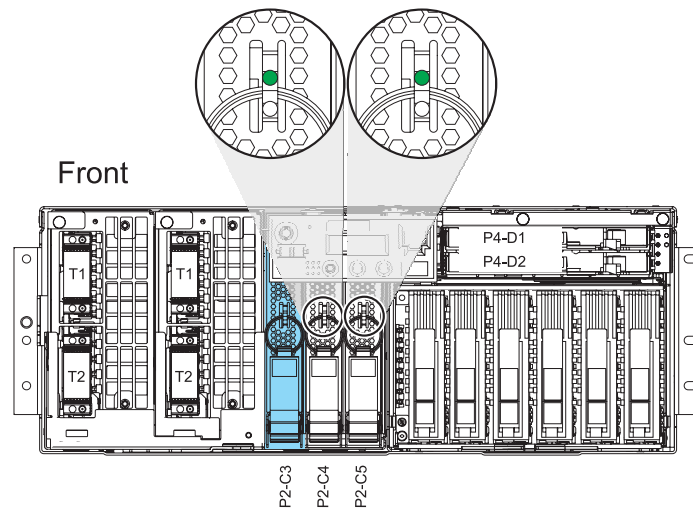
Voltage regulator assembly

Use this procedure to service the voltage regulator assembly.

1. Determine if this procedure can continue concurrently

In order for this procedure to be performed concurrently, the following must be true:

- All three voltage regulators must already be installed in the system.
- The green LEDs must be ON for the voltage regulators not being serviced.



Are the green LEDs ON?

Yes

No

↓

You will be doing a nonconcurrent repair.
Go to step 5 on page 583.

2. Determine if there is a control panel present in the enclosure.

If a control panel is present in the same enclosure as the FRU being serviced, it must be removed.

Is a control panel present in the same enclosure as the FRU being serviced?

Yes

No

↓

Go to step 6 on page 584.

3. Access the ASMI

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power. The ASMI may also be referred to as the service processor menus.

To access the ASMI, refer to “Accessing the ASMI” on page 702.

When you have accessed the ASMI, continue with the next step.

4. Prepare the Control Panel for concurrent replacement

1. In the navigation area of the ASMI, expand “**Concurrent Maintenance**” then select “**Control panel**”.
2. At the Preparing the control panel window, select “Remove” and click “Continue”.
3. Choose the control panel’s location and click “Save Settings”.
4. If the operation was successful, the window will display, “Operation completed successfully”.

Did the operation complete successfully?

No	Yes
↓	Go to step 6 on page 584

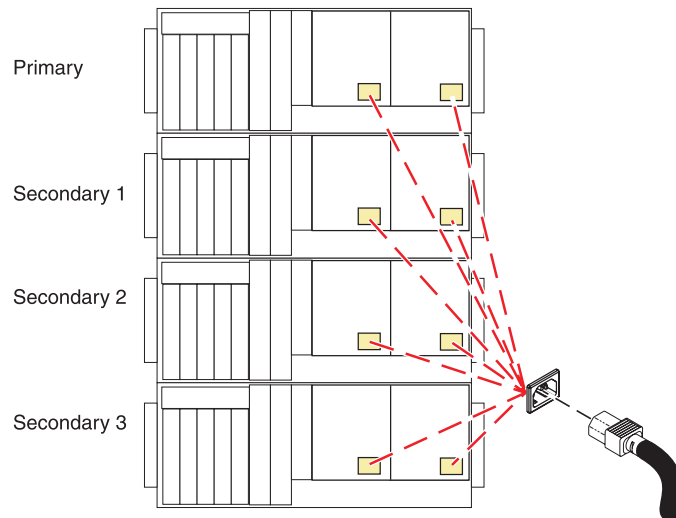
5. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

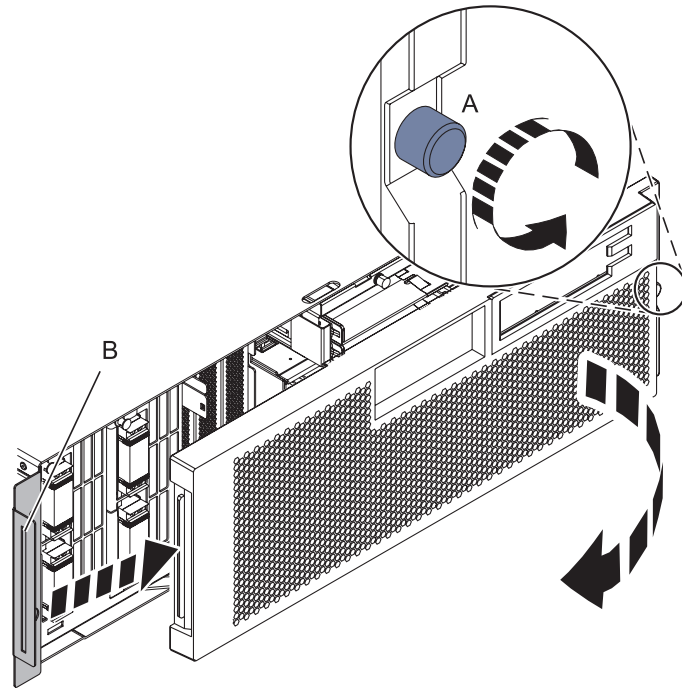
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



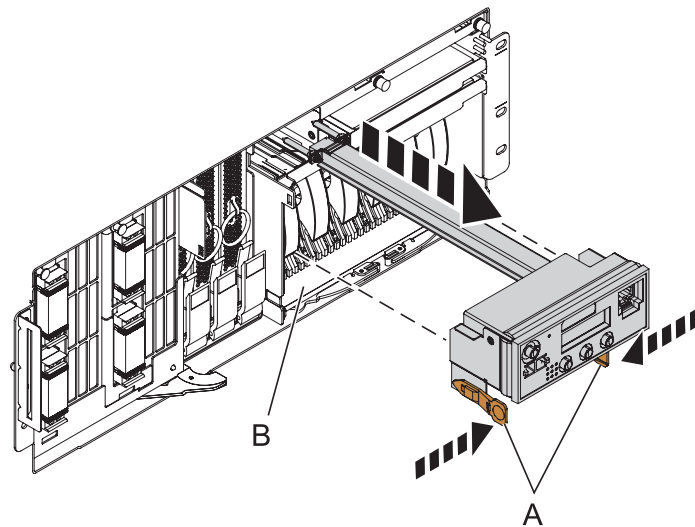
6. Remove the Front Cover

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



7. Remove the Control Panel or Control Panel Filler

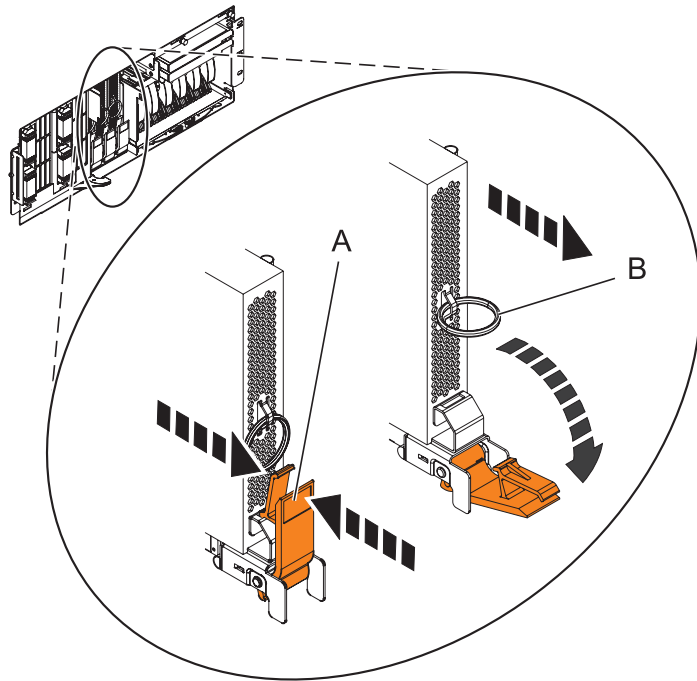
In the enclosure you are servicing, remove the control panel or if present, control panel filler, by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges, and pulling it out of its bay **(B)**.



8. Remove the Voltage Regulator Assembly

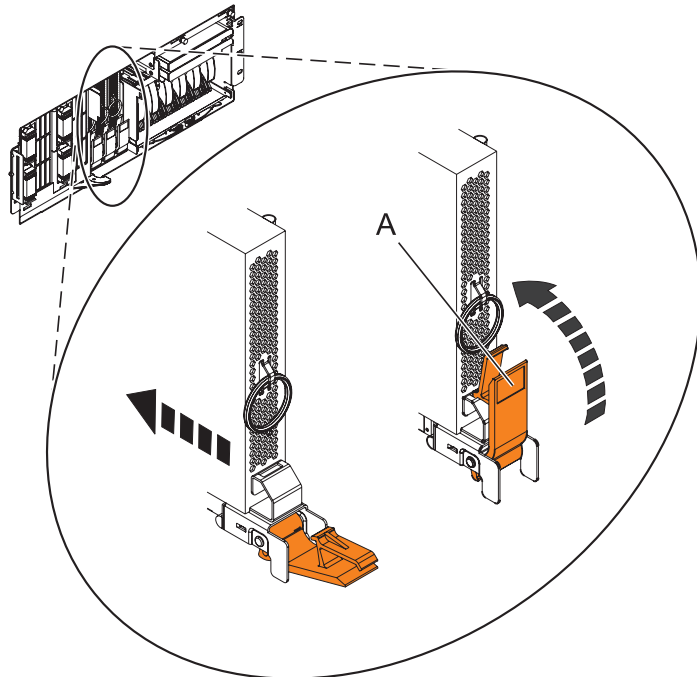
1. Squeeze the top of the latch **(A)** to release it, then rotate the latch out and then down.
2. Grasp the pull ring **(B)** and slowly pull the voltage regulator out of the enclosure.

NOTE: Pulling the voltage regulator assembly out of the card enclosure requires a large amount of force. The voltage regulator assembly is of substantial weight, so grasp it firmly when it is free of the card enclosure.



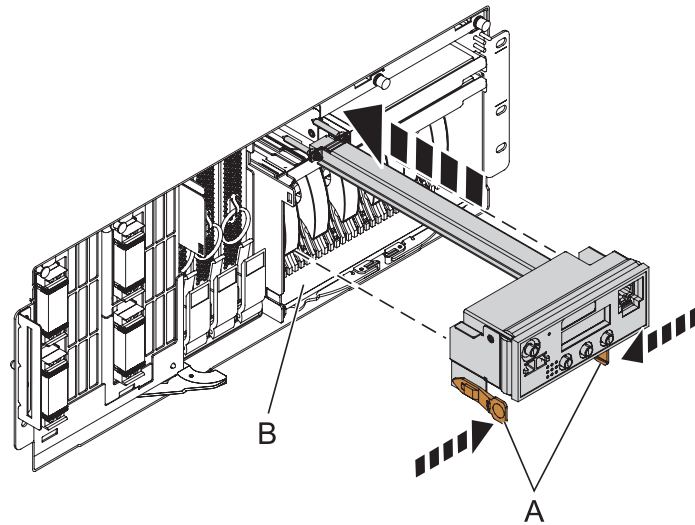
9. Install the new voltage regulator assembly

1. Ensure that the voltage regulator assembly latch **(A)** is rotated out and down into the unlocked position.
2. Carefully grasp the voltage regulator assembly and slide it into the enclosure.
3. When the voltage regulator assembly is all the way into the card enclosure, rotate the latch **(A)** up into the locked position.



10. Install the Control Panel or Control Panel Filler

In the enclosure you are servicing, carefully slide the control panel or if present, control panel filler, into the control panel bay **(B)** until you feel the locking tabs **(A)** lock in place.



11.

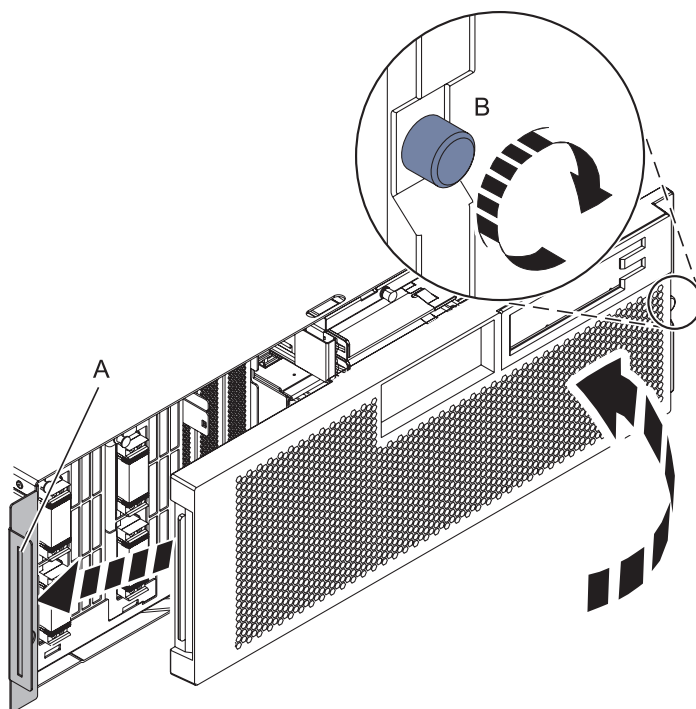
If you are performing a concurrent repair, continue with the next step. Otherwise, go to step 13 on page 587.

12. Install the Control Panel

1. In the navigation area of the ASMI, expand "**Concurrent Maintenance**" then select "**Control panel**".
 2. At the Preparing the control panel window, select "Install" and click "Continue".
 3. Choose the control panel's location and click "Save Settings".
 4. If the operation was successful, the Operation completed successfully window will display.
-

13. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot **(A)** on the left side of the system unit.
2. Tighten the thumbscrew **(B)** on the right side of the cover.
3. Close the front rack door.



14.

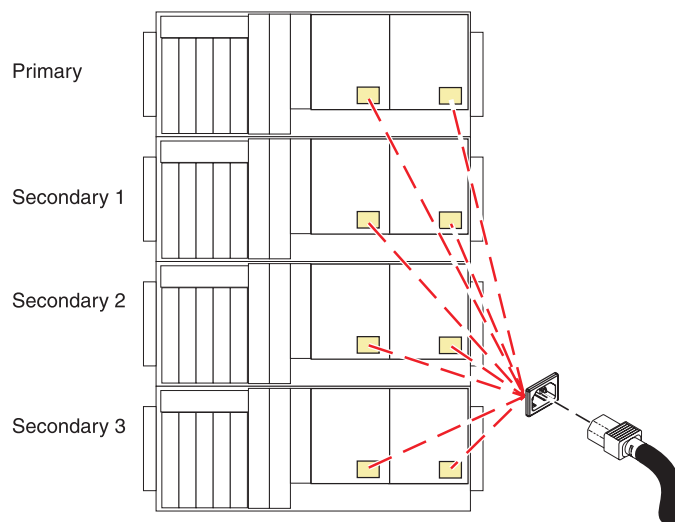
If you are performing a nonconcurrent repair, continue with the next step. Otherwise, go to step 16 on page 588.

15. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



16. **Verify the repair**

Go to Chapter 5, “Verifying a repair,” on page 611.

VPD Card

Use this procedure to service the vital product data (VPD) card.

1. Save the system identifiers

1. Access the Advanced System Management Interface (ASMI) using a Web browser, an ASCII console, or the Hardware Management Console (HMC).
 2. On the ASMI Welcome pane, specify your user ID and password, and click Log In. **NOTE:** To perform this operation, your authority level must be Administrator or Authorized service provider.
 3. In the navigation area, expand System Configuration and Program Vital Product Data.
 4. Select System Keywords.
 5. In the right pane, manually record the values for the machine type-model and system serial number.
-

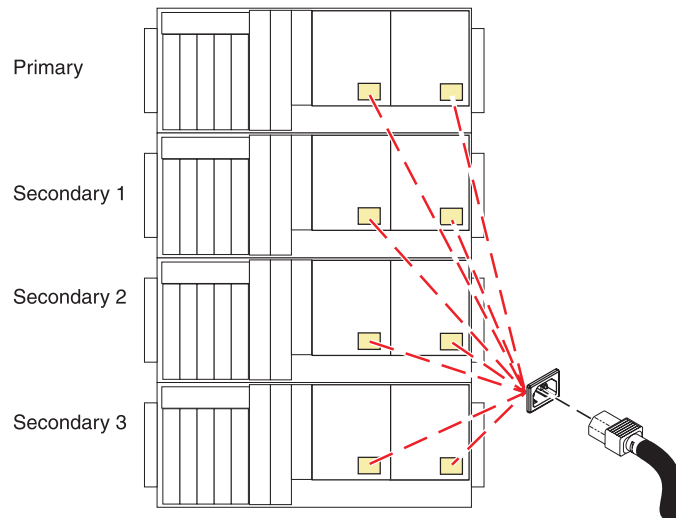
2. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

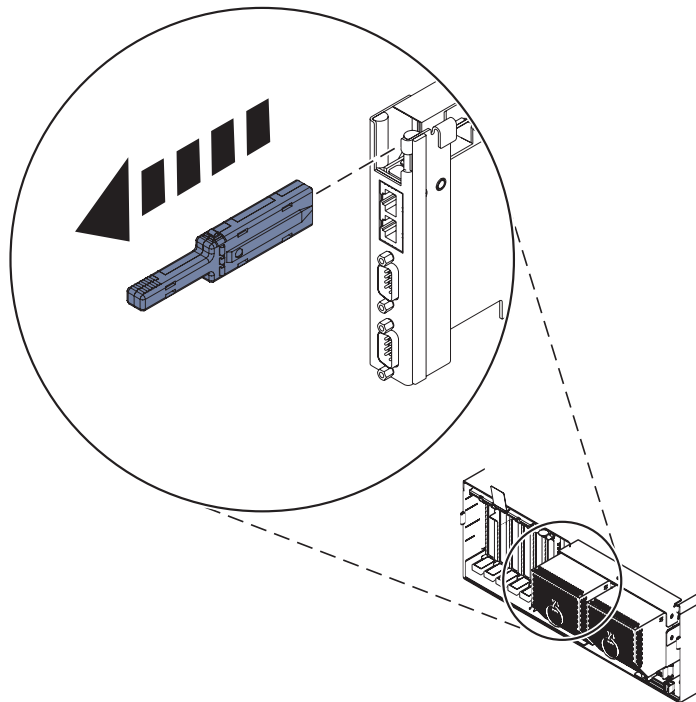
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



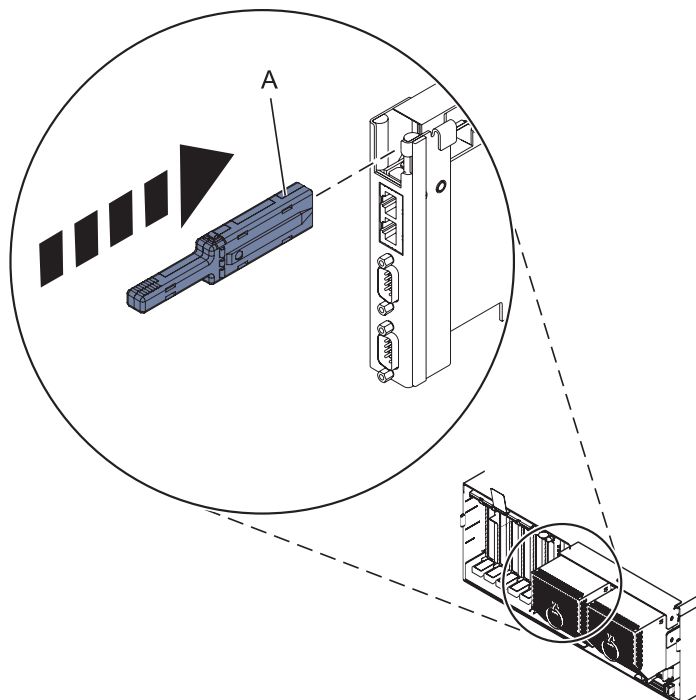
3. Remove the VPD Card

Pull the VPD card free by the blue handle and remove from the system.



4. Install the new VPD card

1. Insert the VPD card with the key **(A)** positioned to the right as shown.
2. Push until fully seated.

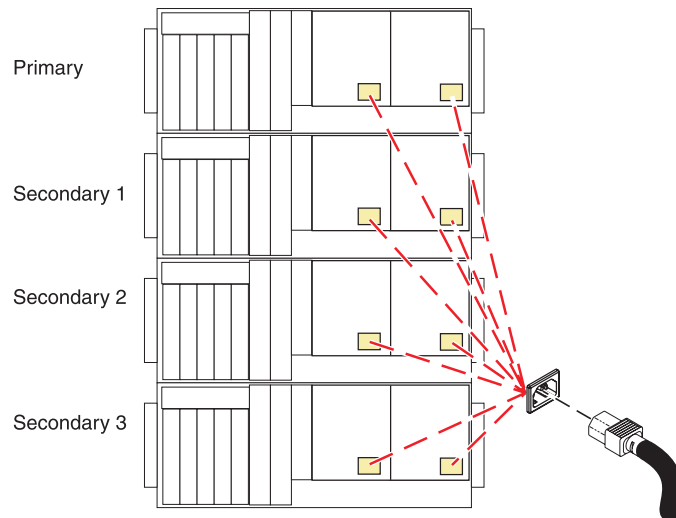


5. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



6. Power On the System

Power on the system. For instructions, refer to “Powering on and powering off” on page 641.

7. Access the ASMI

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power. The ASMI may also be referred to as the service processor menus.

To access the ASMI, refer to “Accessing the ASMI” on page 702.

When you have accessed the ASMI, continue with the next step.

8. Setting the system identifiers

1. Access the Advanced System Management Interface (ASMI) using a Web browser, an ASCII console, or the Hardware Management Console (HMC).
 2. On the ASMI Welcome pane, specify your user ID and password, and click Log In. **NOTE:** To perform this operation, your authority level must be Administrator or Authorized service provider.
 3. In the navigation area, expand System Configuration.
 4. Expand Program Vital Product Data.
 5. Select System Brand.
 6. If the backed up system brand is correct, click **Accept backed up setting and save**. Otherwise, enter the correct system brand and click **Continue**.
 7. **NOTE:** If you do not know the correct system brand, contact your next level of support.
 8. Click **Save settings** to update the system brand to the VPD.
 9. Select System Keywords under Program Vital Product Data.
 10. If the backed up system keywords is correct, click **Accept backed up setting and save**. Otherwise, enter the values for the machine type-model, system serial number, and system unique ID. Set the Reserved field to blank spaces unless directed otherwise by Level 4 technical support. **NOTE:** If you do not know the system unique ID, contact your next level of support. You cannot boot the system until valid values are entered for all fields. You can change these entries only once.
 11. Click **Save settings** to update the system keywords and save them to the VPD.
-

9. Verify the repair

Go to Chapter 5, "Verifying a repair," on page 611.

VPD passthru card

Use this procedure to service the VPD passthru card.

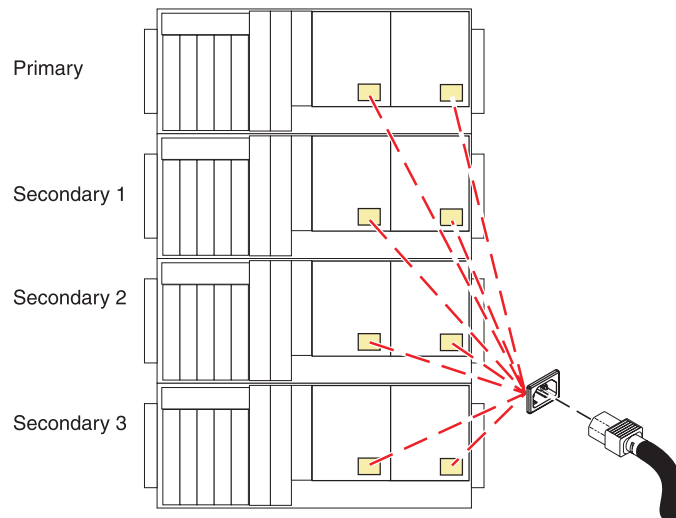
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

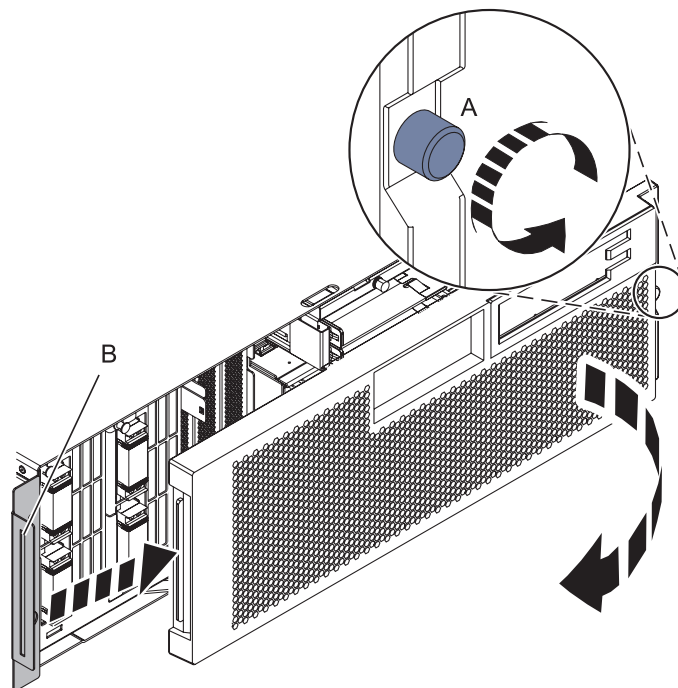
If possible, shut down any running applications and the operating system before powering off the system.

Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



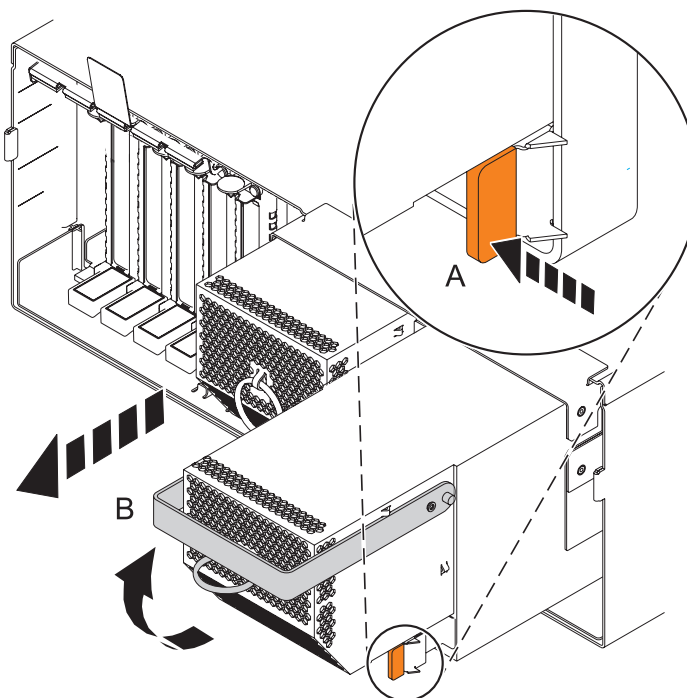
2. Remove the Front Cover

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



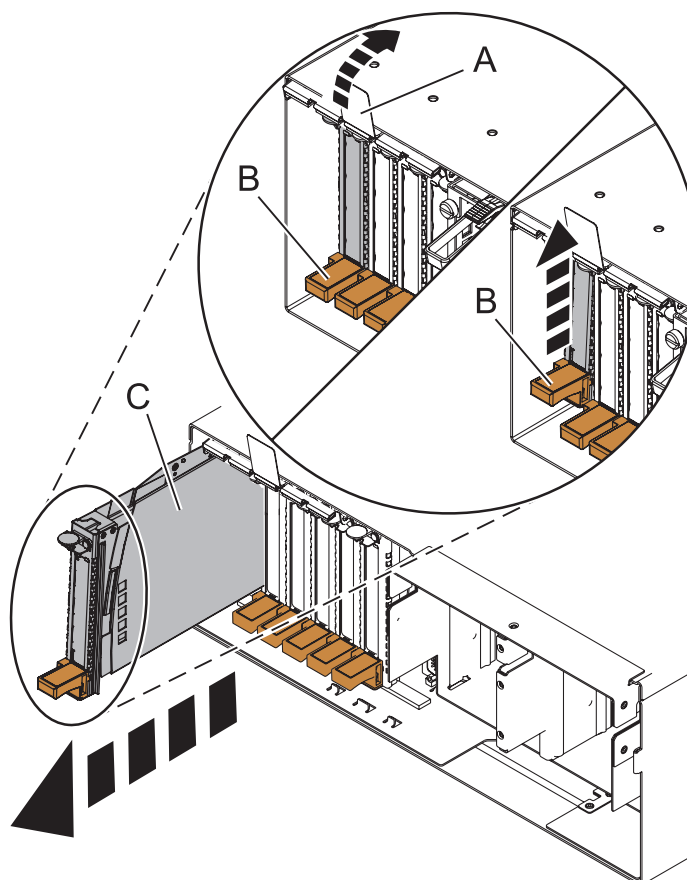
3. Remove both power supplies

1. Push the handle latch **(A)** to release the handle.
2. Lift the handle **(B)** up and into the open position.
3. Using the handle, pull the power supply out of the power supply bay. **CAUTION: This part or unit is heavy, but has a weight smaller than 18 kilograms (39.7 pounds). Use care when lifting, removing, or installing this part or unit. (C008)**
4. Repeat these steps until both power supplies are removed.



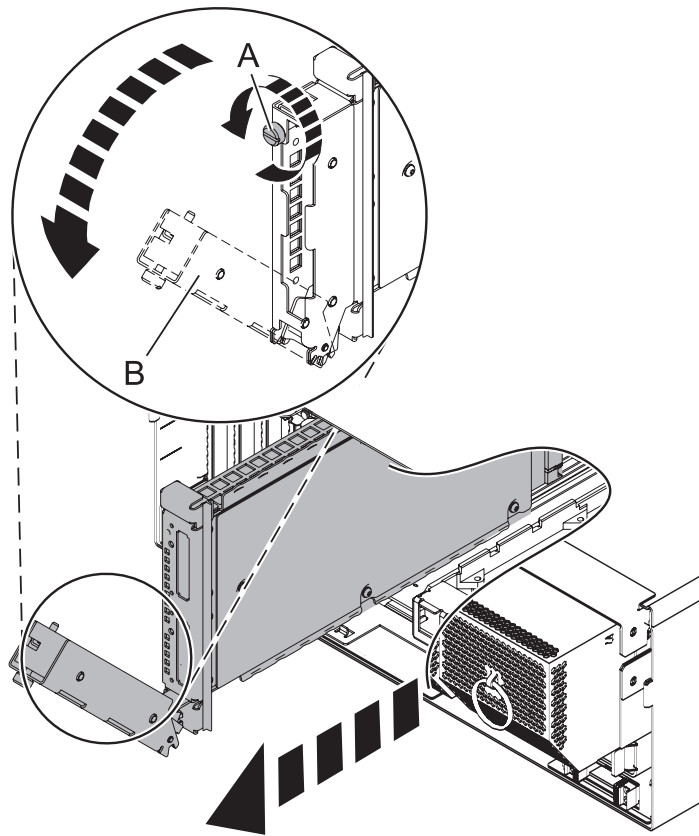
4. Remove all PCI cards

1. Label and remove all PCI cables from the rear of the system.
2. Lift and hold the PCI adapter EMC shield **(A)** in the open position.
3. Lift the lower cassette handle up **(B)** as shown.
4. Pull the PCI cassette **(C)** out of the system unit.
5. Lower the PCI adapter EMC shield into the closed position.
6. Repeat these steps until all PCI Adapter Cards or PCI Adapter Fillers in slots C1 through C5 have been removed.



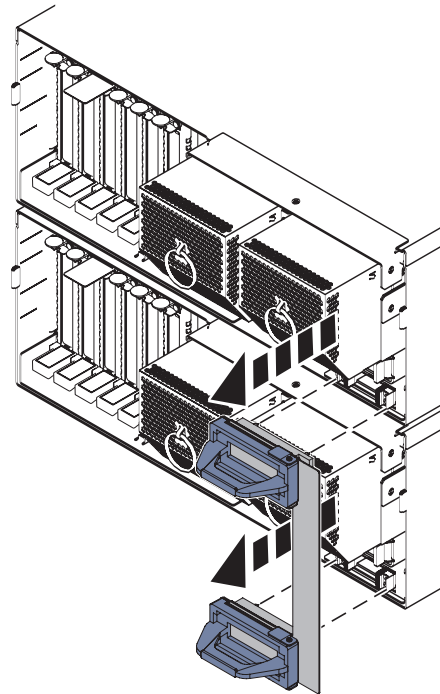
5. Remove the HSL/RIO Adapter Card

1. Label and Remove all HSL/RIO cables from the rear of the system.
2. Rotate the thumbscrew **(A)** counterclockwise to unfasten the card.
3. Pull the handle **(B)** down.
4. Pull the card from its slot.
5. Repeat these steps to remove a second NIC Card (if present).



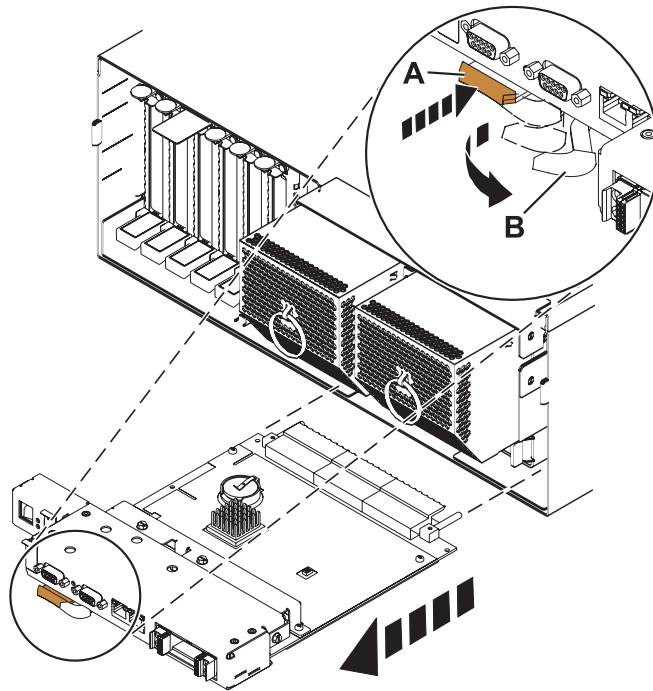
6. Remove the Service Processor Cable

1. Grasp the service processor cable handle on one system unit and pull it from the system unit.
2. Repeat the process for the other system unit.



7. Remove the Service Processor Assembly

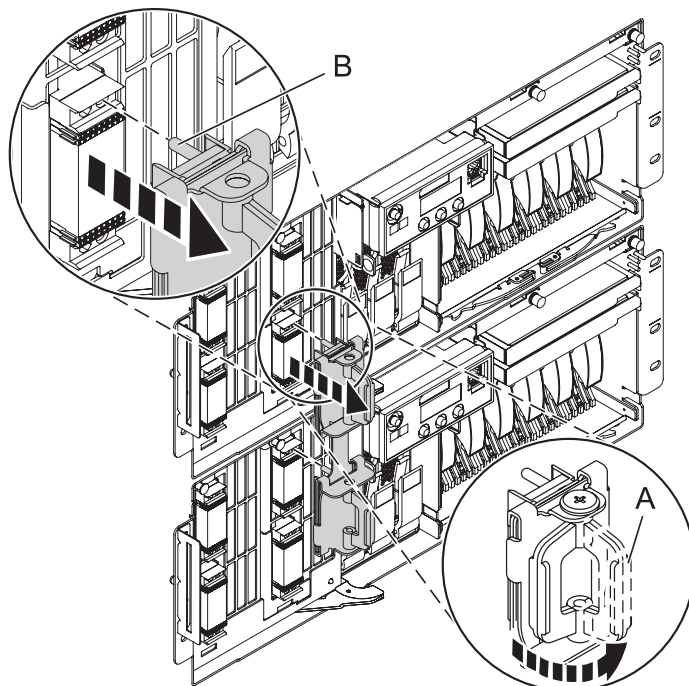
1. Label and disconnect all cables connected to the service processor assembly.
2. Press the thumb release **(A)** on the service processor assembly to unlock the handle.
3. Pull the handle to the right to unseat the service processor assembly.
4. Pull the service processor assembly from the card enclosure using the handle and supporting the bottom of the card.



8. Disconnect SMP Cable

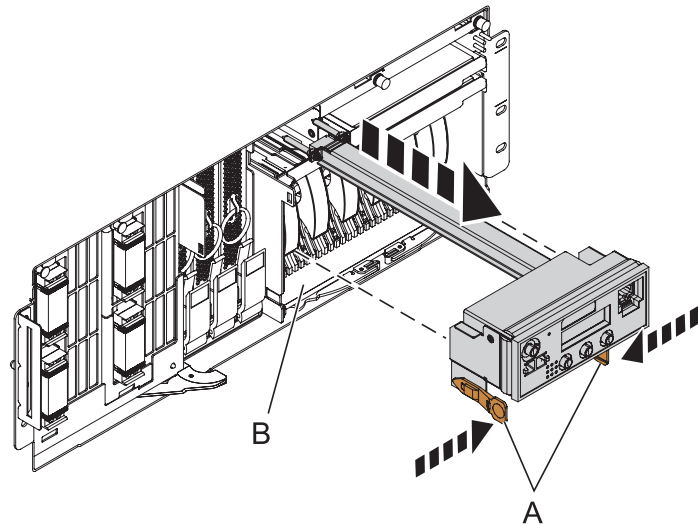
1. Carefully pull the handle **(A)** from the system until the connector is unseated.
2. When the guide pins **(B)** are free, carefully pull the SMP processor cable away from the system unit.

Repeat these steps for all SMP cable connectors that are present on the system you are servicing.



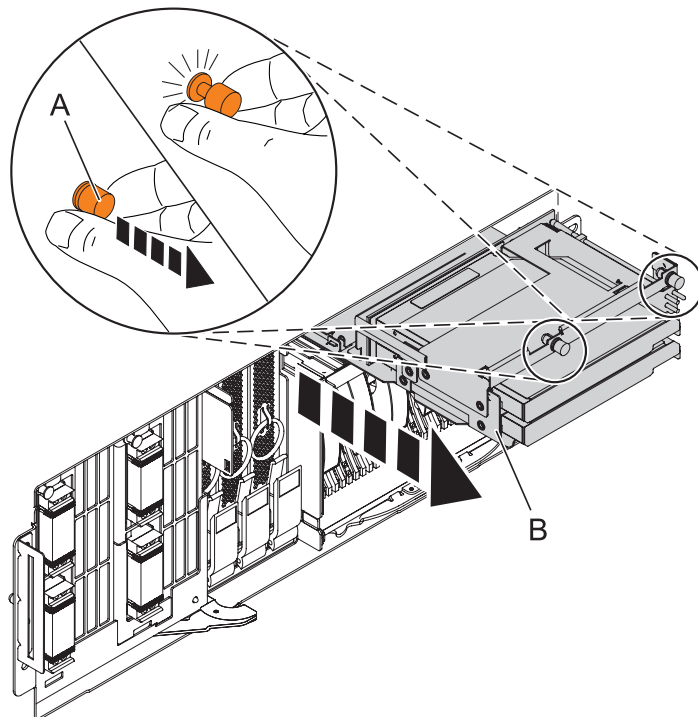
9. Remove the Control Panel or Control Panel Filler

In the enclosure you are servicing, remove the control panel or if present, control panel filler, by pressing the locking tabs **(A)** on both sides of the panel, grasping the edges, and pulling it out of its bay **(B)**.



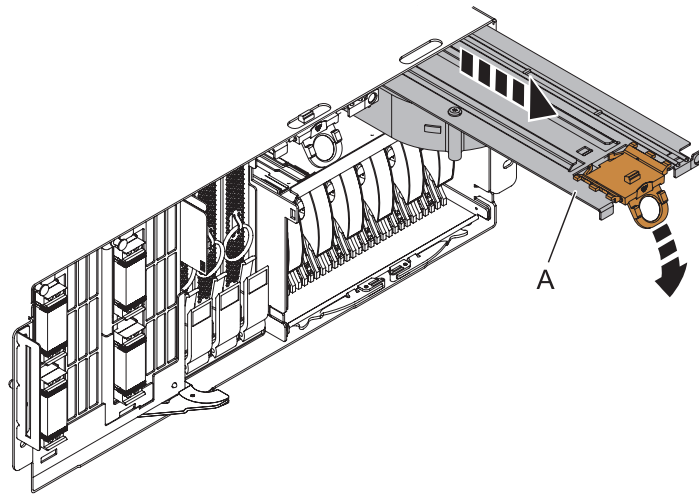
10. Remove the Media Device Enclosure

1. Pull the two terra-cotta locking knobs **(A)** out until they unlock.
2. Pull the enclosure **(B)** out of the system chassis.



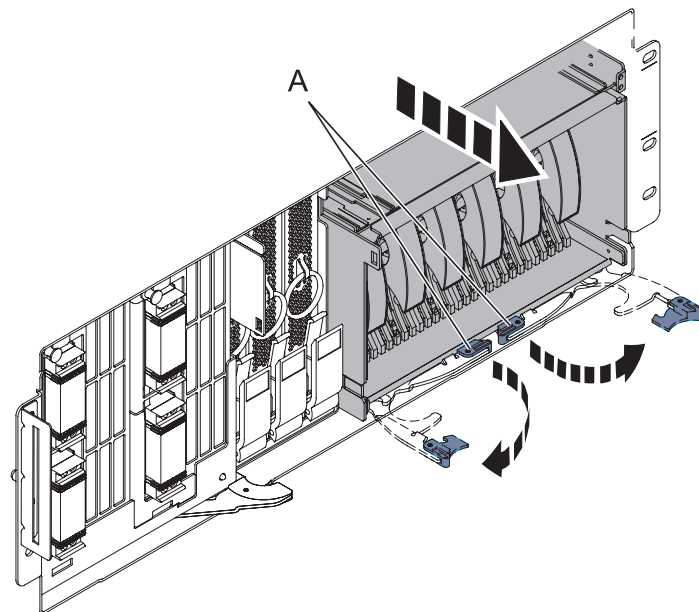
11. Remove the Fans

1. Pull the ring **(A)** downward to disengage it from the system unit.
2. Using the ring, pull the fan straight out of the system unit.
3. Repeat these steps until both fans are removed.



12. Remove the disk unit enclosure

1. Press down and rotate handles **(A)**.
2. Slide the enclosure out of the machine.



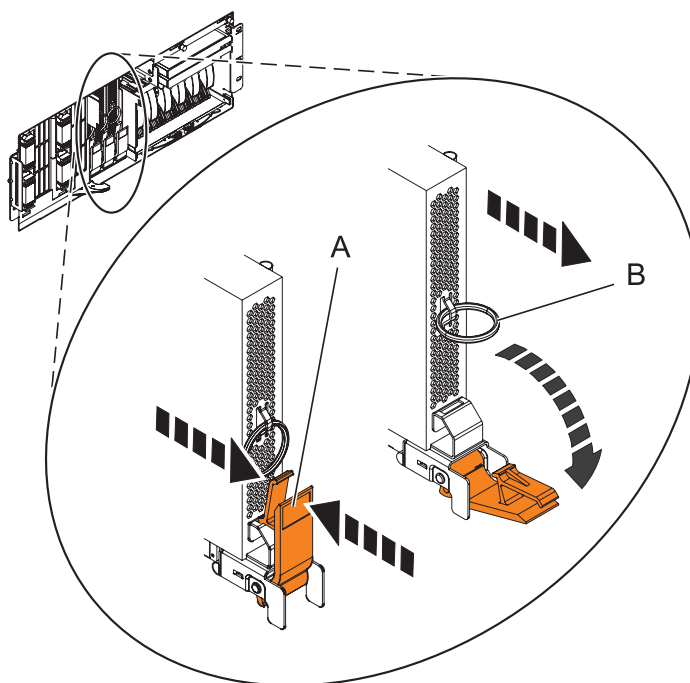
13. Remove the Voltage Regulator Assemblies

1. Squeeze the top of the latch **(A)** to release it, then rotate the latch out and then down.

2. Grasp the pull ring **(B)** and slowly pull the voltage regulator out of the enclosure.

NOTE: Pulling the voltage regulator assembly out of the card enclosure requires a large amount of force. The voltage regulator assembly is of substantial weight, so grasp it firmly when it is free of the card enclosure.

3. Repeat these steps until all voltage regulator assemblies have been removed.

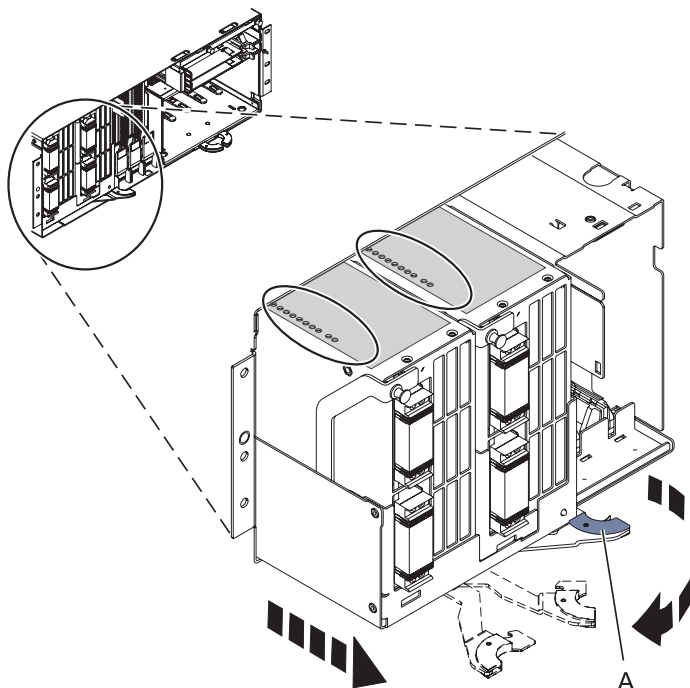


14. Remove the System Backplane Assembly

1. Push the blue lever to the left and out from the system **(A)** to unlock the system backplane assembly.

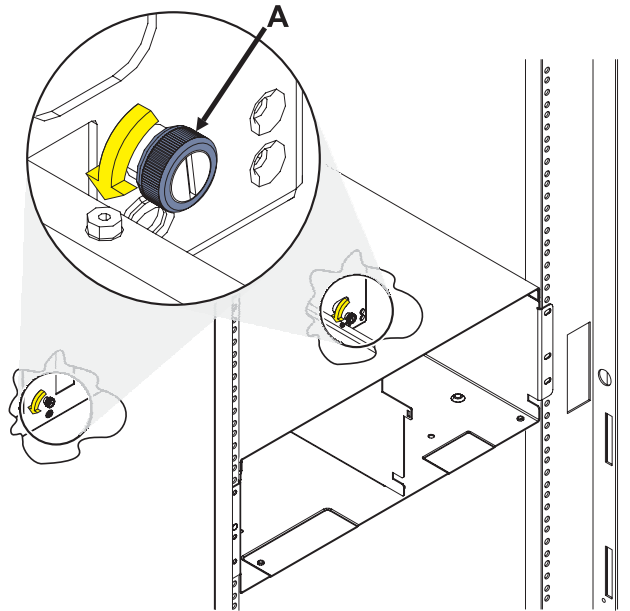
2. Pull the system backplane assembly out of the system using both hands.

ATTENTION: The system backplane assembly weighs 35 lbs and should not be pulled out using the blue lever. Grasp the backplane assembly firmly with both hands when it is free of the system.



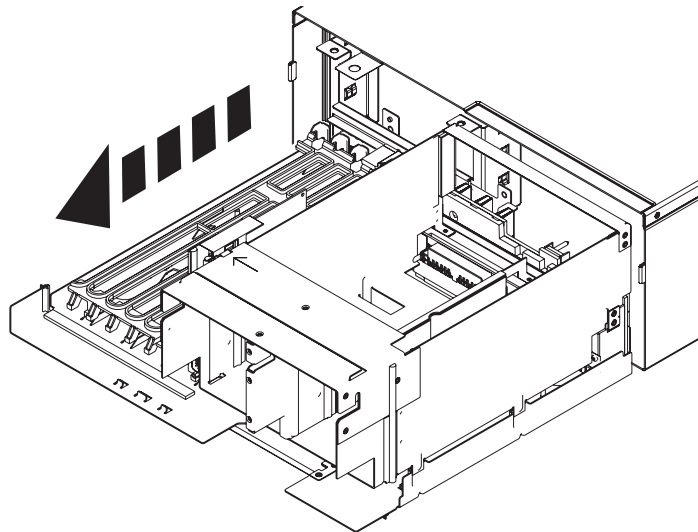
15. Loosen the thumbscrews

Loosen the two thumbscrews **(A)** at the front of the backplane.



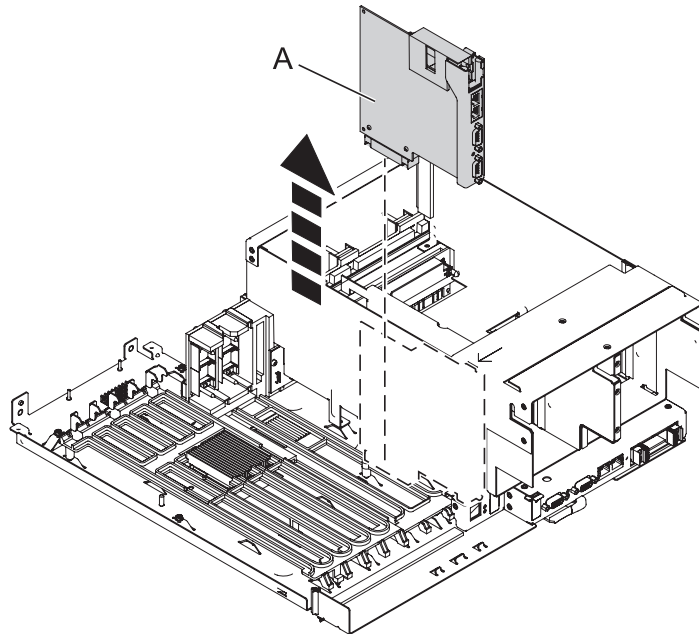
16. Remove the IO backplane from the rear of the system

1. Slide the IO backplane from the enclosure and set it aside.



17. Remove the VPD Passthrough Card

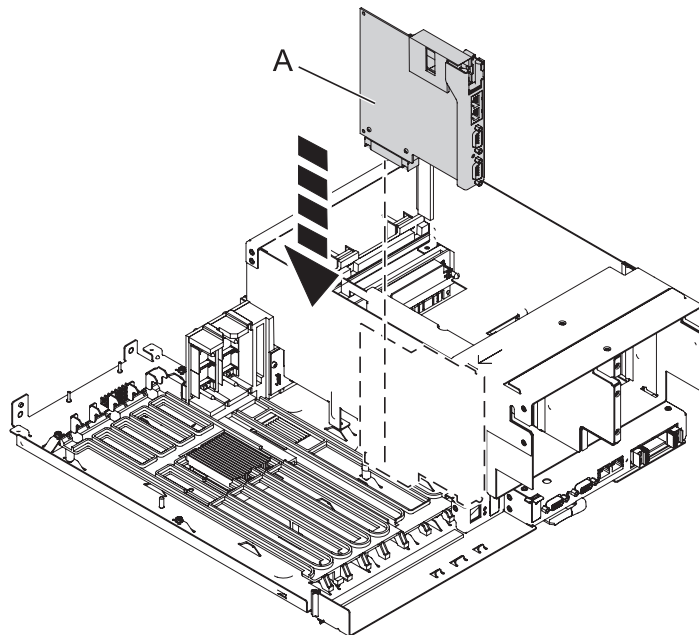
Remove the passthrough card from the I/O backplane assembly by pulling it straight up and out of the I/O backplane assembly.



18. Install the VPD Passthrough Card

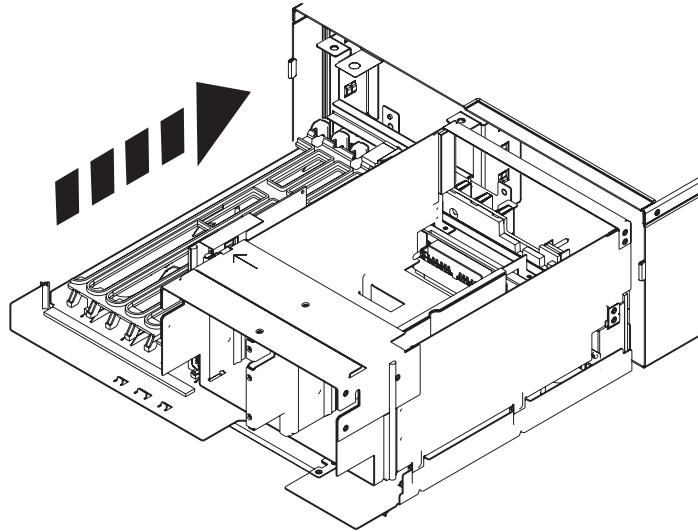
1. Note the metal tab on the top edge of the passthrough card.
2. Insert the card into the connector on the I/O backplane ensuring that the metal tab engages the slot on the top edge of the shroud for the power supplies.

ATTENTION: If the tab does not engage the slot in the shroud, the passthrough card will not connect securely and damage to the pins on the connector could occur.



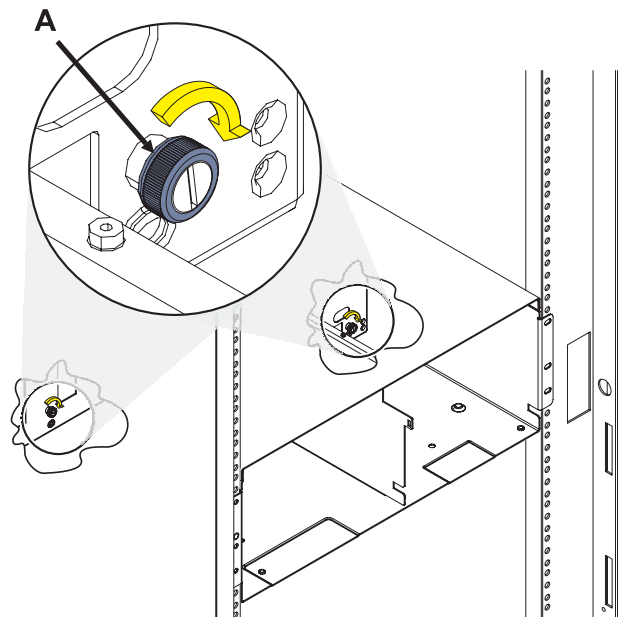
19. Install the IO backplane

1. Carefully slide the IO backplane into the enclosure.



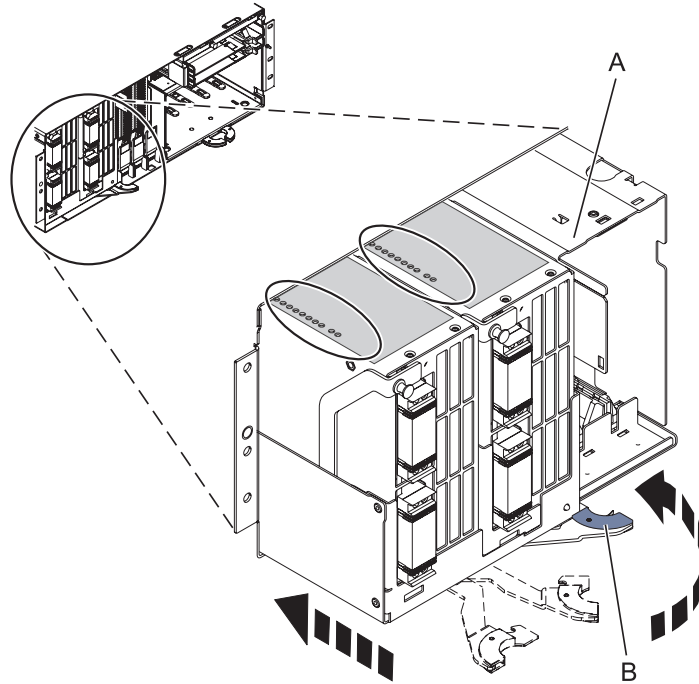
20. Tighten the thumbscrews

1. Tighten the two thumbscrews **(A)** at the front of the backplane.
2. Ensure the backplane is seated properly.



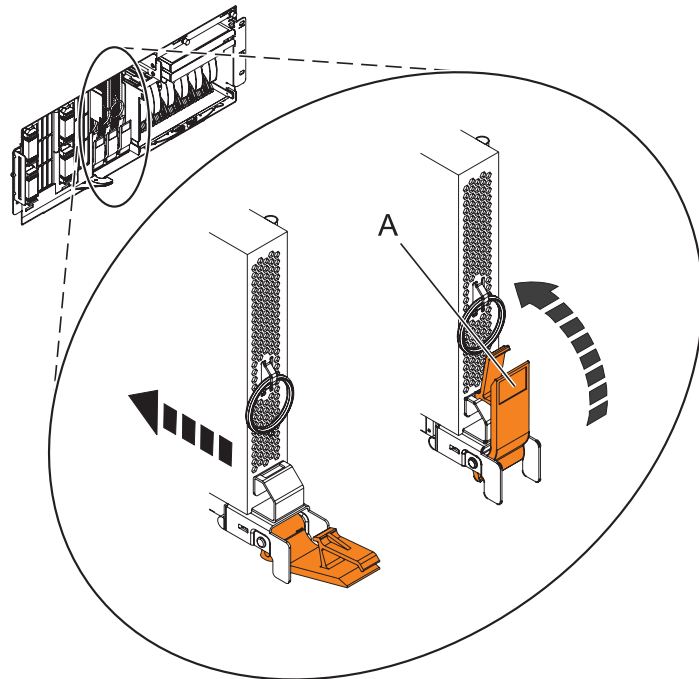
21. Install the System Backplane Assembly

1. Align the system backplane assembly with the slot in the system.
2. Slide the system backplane assembly into the system **(A)**.
3. Push the blue lever **(B)** to the right and in toward the system to lock the system backplane assembly.



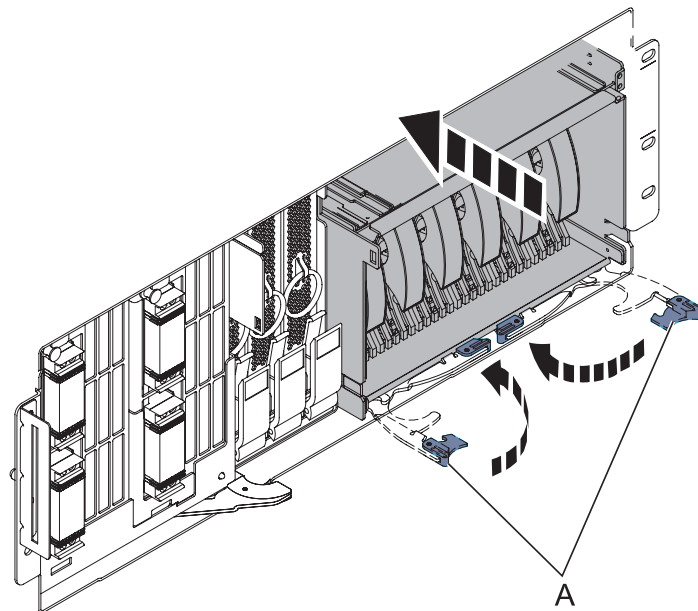
22. Install the Voltage Regulator Assemblies

1. Ensure that the voltage regulator assembly latch **(A)** is rotated out and down into the unlocked position.
2. Carefully grasp the voltage regulator assembly and slide it into the enclosure.
3. When the voltage regulator assembly is all the way into the card enclosure, rotate the latch **(A)** up into the locked position.
4. Repeat these steps until all voltage regulator assemblies have been installed.



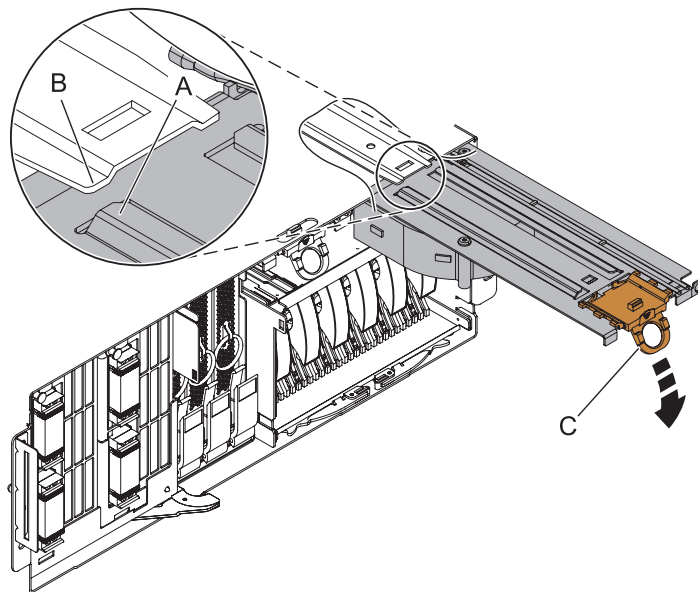
23. Install the disk unit enclosure

1. Insert the new disk unit enclosure into the system unit.
2. Slide the disk unit enclosure into the system until you feel it lock into place.
3. Rotate the handles **(A)** in the direction shown.



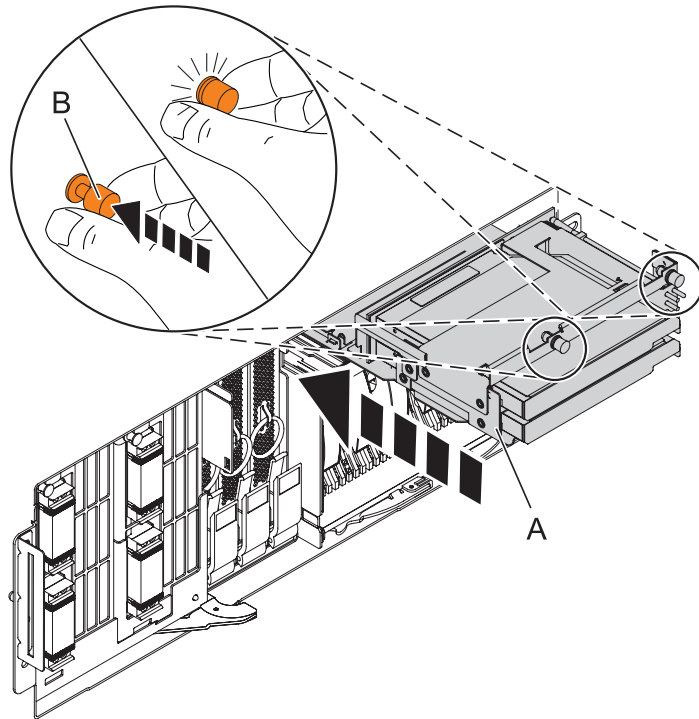
24. Install the Fans

1. Align the fan **(A)** with the guide rails **(B)** inside of the fan slot.
2. Press the fan all the way into the fan slot.
3. Lift up the ring **(C)** to lock the fan into place.
4. Repeat these steps until both fans are installed.



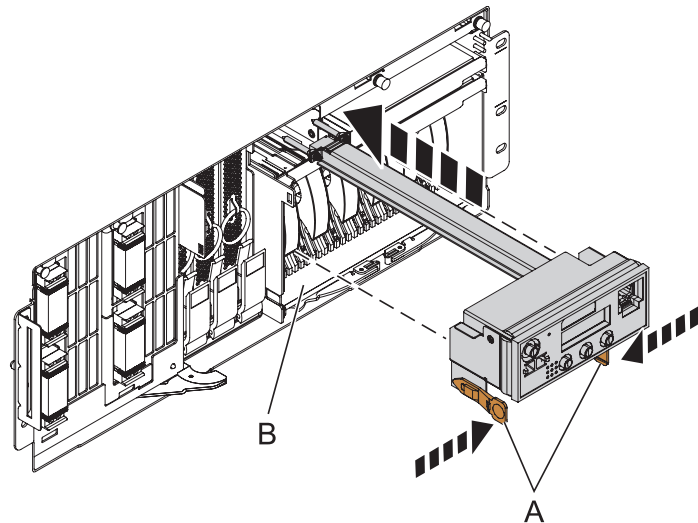
25. Install the Media Device Enclosure

1. Align the media device enclosure with the chassis opening.
2. Push the media device enclosure **(A)** into place, then push the two terra-cotta locking knobs **(B)** into the locked position.



26. Install the Control Panel or Control Panel Filler

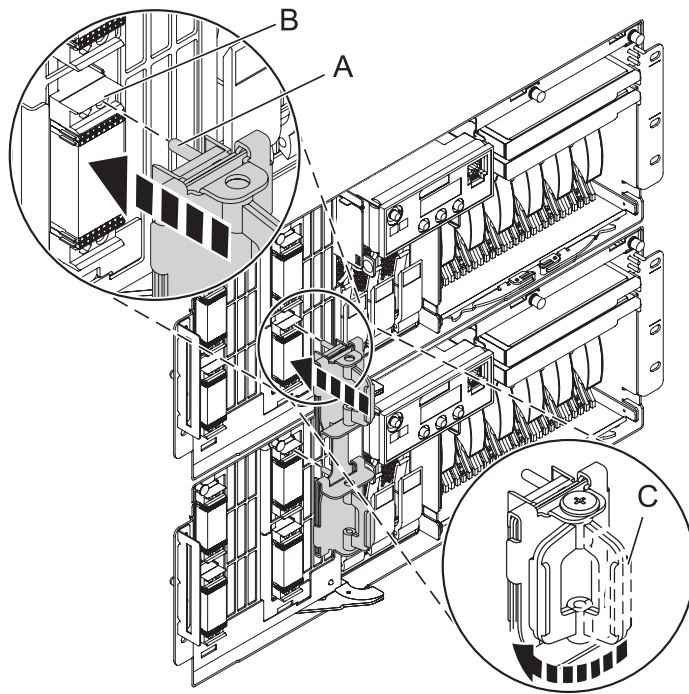
In the enclosure you are servicing, carefully slide the control panel or if present, control panel filler, into the control panel bay **(B)** until you feel the locking tabs **(A)** lock in place.



27. Connect SMP Cable

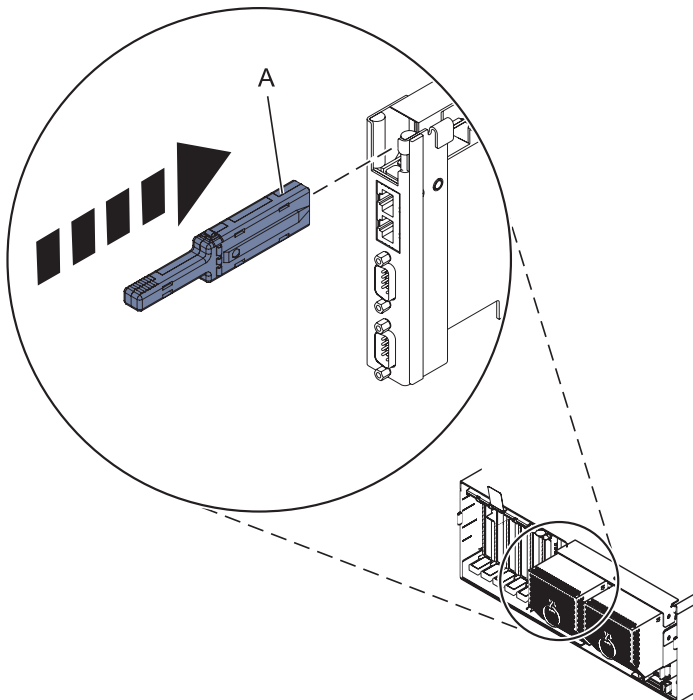
1. Align the guide pins **(A)** with the connectors **(B)** on the system unit.
2. Using the handle **(C)**, carefully push the SMP processor cable into the system unit connector.

Repeat these steps for all SMP cable connectors that are present on the system you are servicing.



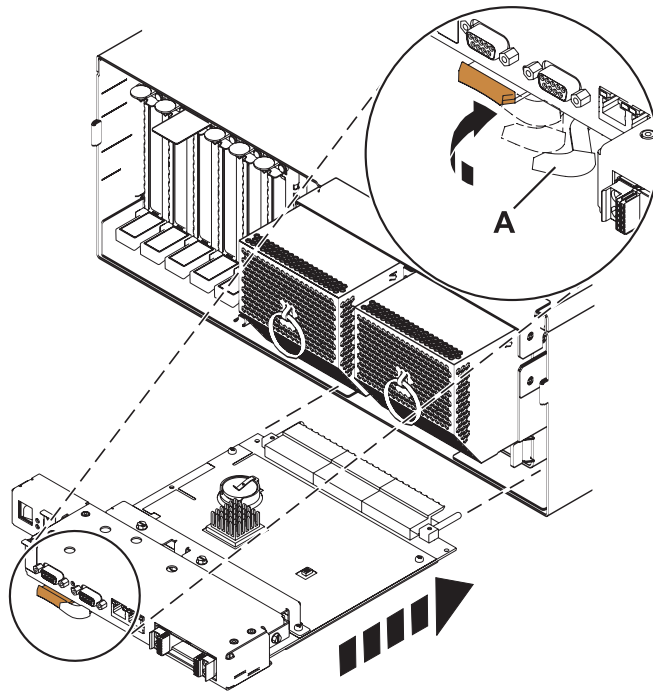
28. Install the VPD Card

1. Insert the VPD card with the key **(A)** positioned to the right as shown.
2. Push until fully seated.



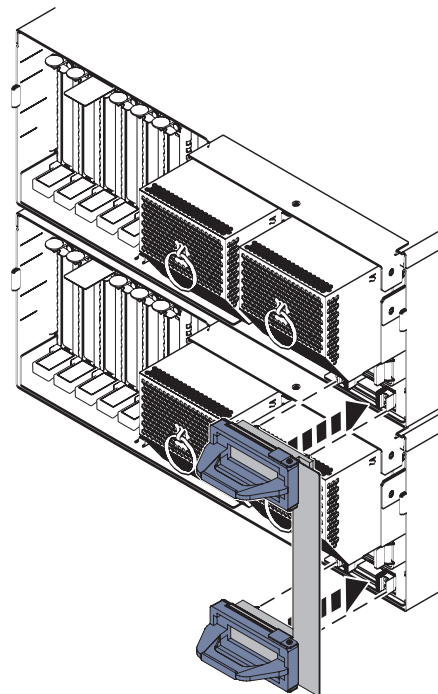
29. Install the Service Processor Assembly

1. Align the service processor assembly with the card slot.
2. Slide the service processor assembly all the way into the card slot in the card enclosure.
3. Push the handle **(A)** towards the service processor assembly until the release tab locks the handle in place. This will secure the service processor assembly into the card slot.
4. Reconnect all service processor assembly cables.



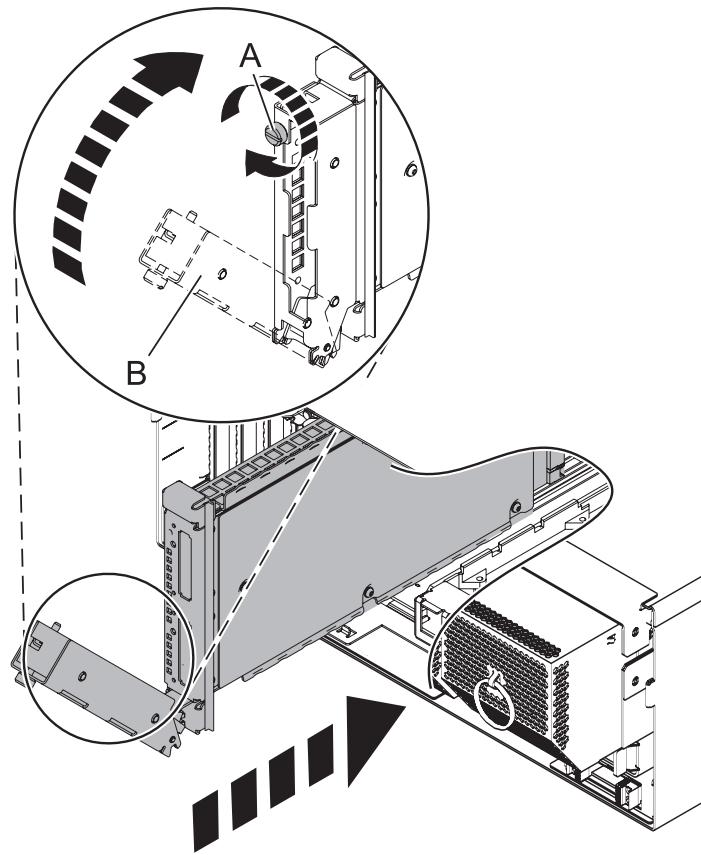
30. Install the Service Processor Cable

1. Align the pins on the back of the service processor cable handle with the alignment holes on the back of one of the system units.
2. Using the handle, push the cable connector in place.
3. Repeat the process for the other system unit.



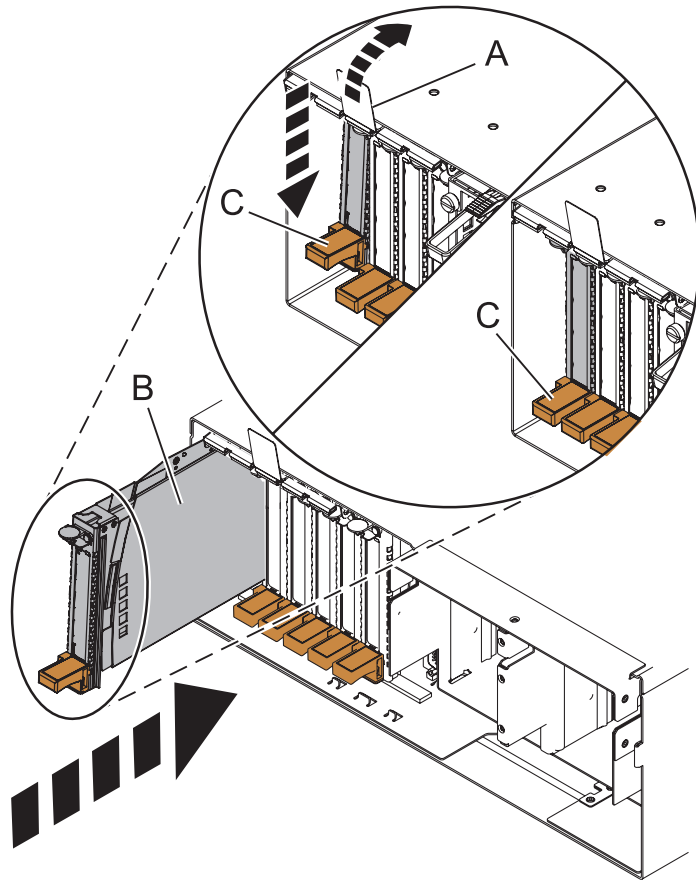
31. Install the HSL/RIO Adapter Card

1. Push the card into its slot.
2. Push the handle **(B)** up and toward the system until the handle stops against the adapter card.
3. Rotate the thumbscrew **(A)** clockwise to fasten the card.
4. Repeat these steps to install a second NIC Card if necessary.



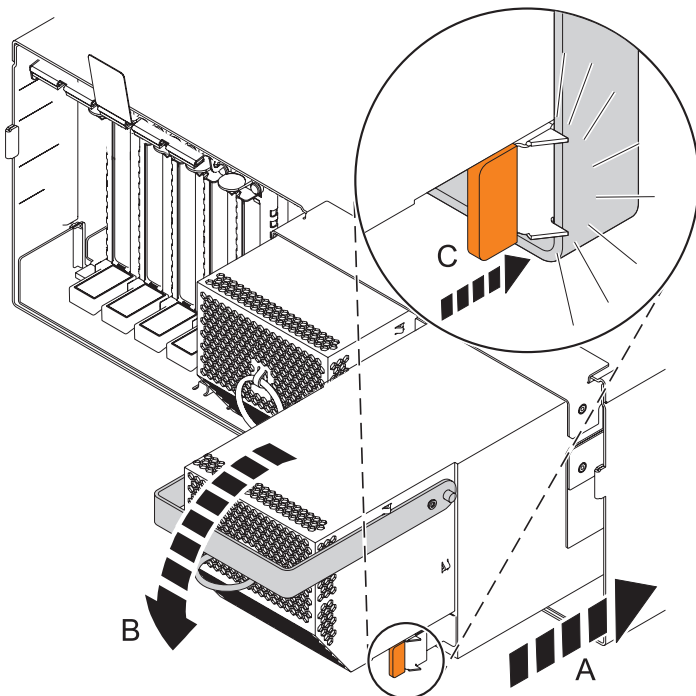
32. Install all PCI Adapter Cards

1. At the back of the system, identify the cassette slot you want to use.
2. Ensure the cassette handle is in the open position.
3. Lift and hold the PCI adapter EMC shield **(A)** in the open position.
4. Slide the cassette **(B)** into the cassette slot as shown.
5. When the cassette is fully inserted into the system, firmly press downward on the lower cassette handle **(C)**.
6. Lower the PCI adapter EMC shield into the closed position.
7. Repeat these steps until all PCI Adapter Cards or PCI Adapter Fillers in slots C1 through C5 have been installed.
8. Install all previously removed PCI cables to the rear of the system.



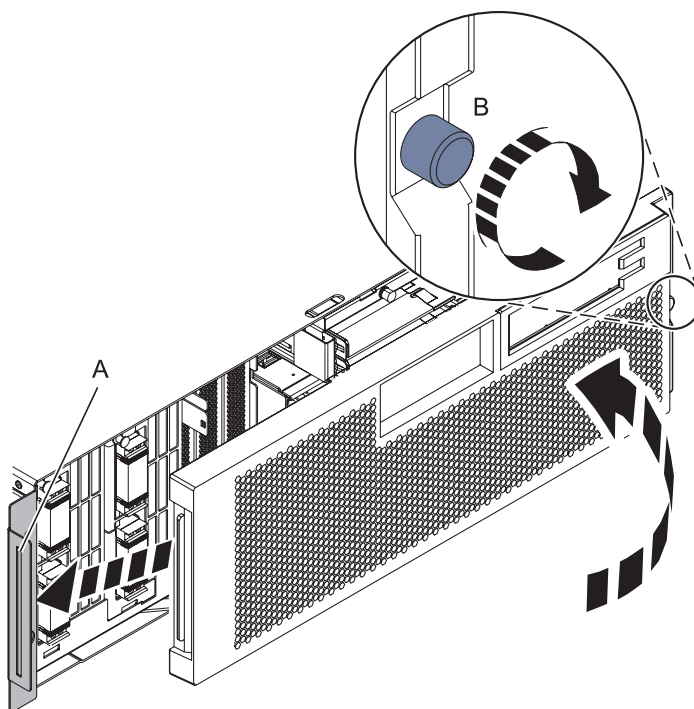
33. Install both power supplies

1. With the handle and latch in the open position, place the power supply in the power supply bay **(A)**.
2. Push the power supply completely into the power supply bay.
3. Close the handle **(B)**, and then push the handle latch into the closed position **(C)**.
4. Repeat these steps until both power supplies are installed.



34. Install the Front Cover

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot **(A)** on the left side of the system unit.
2. Tighten the thumbscrew **(B)** on the right side of the cover.
3. Close the front rack door.

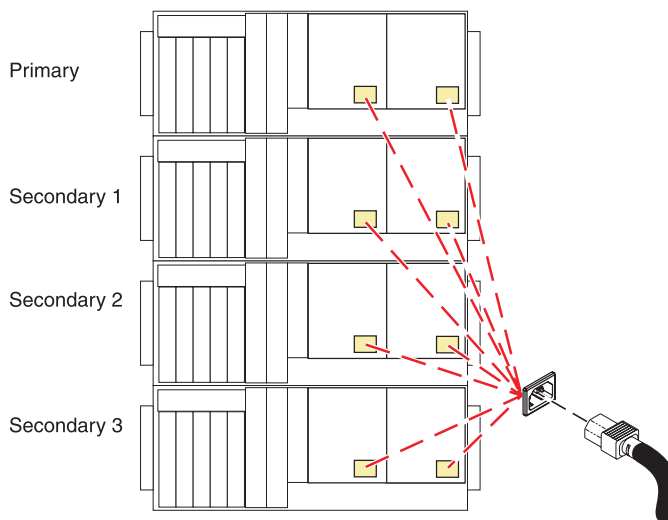


35. Install the power cords

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



36. Verify the repair

Go to Chapter 5, "Verifying a repair," on page 611.

Chapter 5. Verifying a repair

Use this information to verify hardware operation after making repairs to the system.

Choose from the following:

- To verify the repair of a system that is currently powered off, go to step 1.
- To verify the repair of a system that is currently powered on with no operating system loaded, go to step 3.
- To verify the repair of a system that is currently powered on and an operating system is loaded, go to step 5.

1. Power on the server and all attached I/O enclosures.

Did all the enclosures power on?

No	Yes
↓	Go to Step 3.

2. Choose from the following:

- If the original problem was that an enclosure would not power on and you have another FRU to replace, locate and replace the next FRU.
 - If the next FRU in the FRU list is an isolation procedure, perform the isolation procedure.
 - If the original problem was that an enclosure would not power on and you have an isolation procedure to perform, perform the isolation procedure.
 - If the original problem was that an enclosure would not power on and there are no more FRUs or isolation procedures in the FRU list, contact your next level of support.
 - If you have a new problem, perform problem analysis and repair the new problem.
-

3. Load the operating system.

Did the operating system load successfully?

No	Yes
↓	Go to Step 5.

4. Choose from the following:

- If the original problem was a failing disk drive that contained the operating system software, go to step 5.
 - If the original problem was that the operating system would not load and you have another FRU to replace, go to your FRU locations section to locate the next FRU.
 - If the next FRU in the FRU list is an isolation procedure, perform the isolation procedure.
 - If the original problem was that the operating system would not load and you have an isolation procedure to perform, perform the isolation procedure.
 - If the original problem was that the operating system would not load and there are no more FRUs or isolation procedures in the FRU list, contact your next level of support.
 - If you have a new problem, perform problem analysis and repair the new problem.
-

5. Choose from the following:

“Verifying the repair in AIX” on page 612

“Verifying the repair in Linux” on page 616

“Verifying a repair using an i5/OS system or logical partition” on page 617

If you have installed a new feature or part, verify that the system recognizes the feature or part by using the i5/OS system service tools. Use the procedure in this section to accomplish this task.

Verifying the repair in AIX

Use this MAP to check out the server after a repair is completed.

1. Did you replace a disk drive in the root volume group?

NO Go to step 3

YES Continue with the next step.

2. Run standalone diagnostics from either a CD or from a Network Installation Management (NIM) server.

Did you encounter any problems?

NO Reinstall the operating system and continue with step 5.

YES If the original problem still exists, replace the FRU or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, go to Beginning Problem Analysis.

3. Did you replace a FRU with power on and concurrently with system operations?

NO Go to step 5.

YES Continue with the next step.

4. Did you use an AIX diagnostics service aid hot-swap operation to change the FRU?

YES Go to step 6.

NO Go to step 7 on page 613.

Note: The AIX diagnostic service aid was used if a resource was removed using the **Hot Plug** task.

- 5.

Note: If any FRUs have been removed that should be reinstalled, reinstall them now.
Perform the following:

1. If the system is not powered on, power it on now.
2. Perform a slow boot.
3. Wait until the AIX operating system login prompt displays or until system activity on the operator panel or display apparently has stopped.
4. Did you encounter any problems?

NO Continue at step 6.

YES If the original problem still exists, replace the FRU or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, go to Beginning Problem Analysis.

6. If the **Resource Repair Action** menu is already displayed, go to step 9 on page 613; otherwise, perform the following:

1. Log into the operating system either with root authority (if needed, ask the customer to enter the password) or use the CE login.
 2. Enter the `diag -a` command and check for missing resources. Follow any instructions that display. If an SRN displays, suspect a loose card or connection. If no instructions display, no resources were detected as missing. Continue with the next step.
-

7. Perform the following:

1. Enter `diag` at the command prompt.
2. Press Enter.
3. Select the **Diagnostics Routines** option.
4. When the DIAGNOSTIC MODE SELECTION menu displays, select **System verification**.
5. When the DIAGNOSTIC SELECTION menu displays, select the **All Resources** option or test the FRUs you exchanged, and any devices that are attached to the FRU(s) you exchanged, by selecting the diagnostics for the individual FRU.

Did the RESOURCE REPAIR ACTION menu (801015) display?

NO Continue with the next step.

YES Go to step 9.

8. Did the TESTING COMPLETE, no trouble was found menu (801010) display?

YES Use the **Log Repair Action** option, if not previously logged, in the TASK SELECTION menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action.

If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.

Note: If the system attention indicator is on, this action will set it back to the normal state.

Go to step 11 on page 614.

NO If the original problem still exists, replace the FRU or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, go to Beginning Problem Analysis.

9. When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the RESOURCE REPAIR ACTION menu displays.

After replacing a FRU, you must select the resource for that FRU from the RESOURCE REPAIR ACTION menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.

Note: If the system attention indicator is on, this action will set it back to the normal state.

Perform the following:

1. Select the resource that has been replaced from the RESOURCE REPAIR ACTION menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
2. Press **Commit** after you make your selections.

Did another Resource Repair Action (801015) display?

NO If the No Trouble Found menu displays, go to step 11.

YES Continue with the next step.

10. The parent or child of the resource you just replaced may also require that you run the RESOURCE REPAIR ACTION service aid on it.

When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the RESOURCE REPAIR ACTION menu displays.

After replacing that FRU, you must select the resource for that FRU from the RESOURCE REPAIR ACTION menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.

Note: If the system attention indicator is on, this action will set it back to the normal state.

Perform the following:

1. From the RESOURCE REPAIR ACTION menu, select the parent or child of the resource that has been replaced. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
 2. Press **COMMIT** after you make your selections.
 3. If the No Trouble Found menu displays, continue with the next step.
-

11. If you changed the service processor or network settings, as instructed in previous MAPs, restore the settings to the value they had prior to servicing the system. If you ran standalone diagnostics from CD-ROM, remove the standalone diagnostics CD-ROM from the system.

Did you perform service on a RAID subsystem involving changing of the PCI RAID adapter cache card or changing the configuration?

Note: This information does not apply to the PCI-X RAID adapter or cache.

NO Go to the close of call procedure.

YES Continue with the next step.

12. Use the **Recover Options** selection to resolve the RAID configuration. To do this, perform the following:

1. On the PCI SCSI Disk Array Manager screen, select **Recovery options**.
 2. If a previous configuration exists on the replacement adapter, this must be cleared. Select **Clear PCI SCSI Adapter Configuration**. Press F3.
 3. On the Recovery Options screen, select **Resolve PCI SCSI RAID Adapter Configuration**.
 4. On the Resolve PCI SCSI RAID Adapter Configuration screen, select **Accept Configuration on Drives**.
 5. On the PCI SCSI RAID Adapter selections menu, select the adapter that you changed.
 6. On the next screen, press Enter.
 7. When you get the Are You Sure selection menu, press Enter to continue.
 8. If you get a Failed status message, verify that you selected the correct adapter, then repeat this procedure. When the recovery is complete, exit the operating system.
 9. Go to the close of call procedure.
-

Verifying the repair in Linux

1. Run standalone diagnostics from either a CD or from a Network Installation Management (NIM) server. For more information, see Running the eServer stand-alone diagnostics from CD-ROM.

Did you encounter any problems?

NO Reboot the operating system and continue with the close of call procedure.

YES If the original problem still exists, replace the FRU or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, perform problem analysis and repair the new problem.

Verifying a repair using an i5/OS system or logical partition

If you have installed a new feature or part, verify that the system recognizes the feature or part by using the i5/OS system service tools. Use the procedure in this section to accomplish this task.

1. Deactivate the failing item indicator light and close the service action log entry.
2. Be sure you are signed on **with at least service level authority**.
3. On the command line of the i5/OS session, type `strsst` and press Enter.

Note: If you cannot get to the System Service Tools display, use function 21 from the control panel. Alternatively, if the system is managed by Hardware Management Console (HMC), use the Service Focal Point Utilities to get to the Dedicated Service Tools (DST) display.

4. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.

Note: The service tools password is case-sensitive.

5. Select **Start a service tool** from the System Service Tools (SST) display. Press Enter.
6. Select **Hardware service manager** from the Start a Service Tool display. Press Enter.
7. Select **Logical hardware resources (buses, IOPs, controllers)** from the Hardware Service Manager display. This option allows you to display and work with logical resources. Logical hardware resources are the functional resources of the system used by the operating system.
8. Press Enter.

When you select one of the options from the Logical Hardware Resources display, you can do the following:

- Display logical hardware resource status
- Display or change logical hardware resource information
- Display associated packaging hardware resources

For more information on collecting information and performing specific functions using the options and function keys from the Logical Hardware Resources display or for details on the symbols that appear next to the Resource Description field, see the online Help information.

Chapter 6. Closing a service call

Perform these procedures to close problem numbers, clear hardware messages, and prepare the server to return to the customer.

Follow this checklist before performing the procedures:

- Return the server to the state that the customer normally uses such as IPL type, IPL mode, and the way the system is configured or partitioned.

Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.

- While you were performing the problem analysis on the original serviceable event, other serviceable events might have been opened. Close all serviceable events that were opened as a result of your service activity.
- Ensure that server verification has been performed and there are no problems that require additional service actions.
- If the repair was done using the HMC online repair procedures, ensure that the original serviceable event is now closed.

1.

For future reference, record the SRC or symptom and the location code of the FRU you replaced.

Is the server managed by an HMC?

Yes

↓

No

Do one of the following:

- If the server is managed by IVM, Go to “Closing a service call using Integrated Virtualization Manager” on page 625.
 - If the server is not partitioned and running AIX or Linux, go to “Closing a service call using AIX or Linux” on page 631.
-

2.

On the HMC, open Manage Serviceable Events and examine the service action event log for any open service action events.

3.

Are there any service action events that are open?

Yes

↓

No

If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 636. Return the system to the customer. **This completes the repair.**

4.

Record the list of open service action events.

5.

From the list of serviceable events recorded in step 4 on page 619, perform step 6 through step 32 on page 623 for each open service action event.

6.

Determine the error class of the serviceable event. Record for future use.

7.

Examine the details of the open service action event.

Is the error code associated with this service action event the same as recorded in Step 1 on page 619?

No

↓

Yes

Go to step 11 on page 621.

8.

Examine the FRU list of the service action event. Are there any FRUs listed for the service action event?

Yes

↓

Yes

Go to step 11 on page 621.

9.

Is the FRU list identical (same FRUs, same number of FRUs, and same order of FRUs) to the FRU list of the error code recorded in step 1 on page 619?

No

↓

Yes

Go to step 11 on page 621.

10.

The FRU list is different.

Is the FRU you replaced and recorded in step 1 on page 619 in the list of FRUs for this service action event?

Yes

↓

No

Go to step 32 on page 623.

Note: There are service action events that will remain open when you leave this MAP. Further service actions may be required to complete the repair.

11.

Examine the details of this service action event, and record the partitions involved in this service action event for use in a later step.

12.

Is the error code associated with this service action event of the form A11-xxx or A01-xxx?

Yes

↓

No

Go to step 17.

13.

Have you begun a list of "Axx" partitions from prior service action events that you processed in this MAP?

No

↓

Yes

Go to step 15.

14.

Begin a new list of "Axx" partitions by copying the list of partitions obtained in step 11. Go to step 16.

15.

Add the partition list obtained in step 11 to the existing list of "Axx" partitions obtained from processing previous service action events in this MAP.

16.

Remove all entries in the list of all partitions you recorded in step 11. If you are referred to the list of partitions obtained in step 11 in future steps, the list is empty. Go to step 17.

17.

Select and highlight the service action event from the Error Associated With This Serviceable Event window.

18.

Click **Close Event**.

19.

Add comments for the serviceable event. Include any unique additional information. Click **OK**.

The following steps will add or update FRU information.

20.

Did you replace, add, or modify a FRU of the open service action event?

Yes

↓

No

Go to step 22.

21.

From the FRU list, select a FRU that you need to update.
Double-click on the FRU, and update the FRU information. Go to step 23.

22.

Select the **No FRU Replaced for this Serviceable Event** option.

23.

Click **OK** to close the service action event.

24.

Is the list of all partitions you recorded in step 11 on page 621 empty?

No

↓

Yes

Go to step 32 on page 623.

25.

Does the list of all partitions you recorded in step 11 on page 621 contain more than one entry?

Yes

↓

No

Go to step 32 on page 623.

26.

Is the error class recorded in step 25 AIX?

Yes

↓

No

Go to step 32 on page 623.

27.

Perform the following steps for each entry in the list of all partitions you recorded in step 11 on page 621, except the partition you were using to debug the original problem.

28.

From the HMC virtual terminal window of a partition in the list of all partitions, type *diag* at the AIX command prompt.

29.

When the diagnostic operating instructions are displayed, do the following:

1. Press Enter.
 2. Select the **Task Selection** option.
 3. Select the **Log Repair** option.
 4. Select the resource associated with the repair action. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
 5. Click **Commit** after you have made your selection.
-

Note: If the terminal type is not defined, you are prompted to define it before you can proceed.

30.

Exit from diagnostics in this partition and return to the AIX prompt.

31.

Have all the partitions in the list of all partitions you recorded in step 11 on page 621 been processed?

Yes

↓

No

Go to step 27 on page 622 to process the next partition in the list you recorded in step 11 on page 621.

32.

Have all the serviceable events recorded in step 4 on page 619 been processed?

Yes

↓

No

Go to step 5 on page 620 and process the next service action event in the list of serviceable events recorded in step 4 on page 619.

33.

While processing all service action events, were you directed to step 14 on page 621?

Yes

↓

No

If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 636. Return the system to the customer. **This completes the repair.**

Note: If during the processing of the list of open service action events, some service action events remained open, further service actions may be required to complete the repair.

34.

Perform the following steps for each entry in the list of "Axx" partitions you began recording in step 14 on page 621, except the partition you were using to debug the original problem.

35.

From the HMC virtual terminal window of a partition in the list of "Axx" partitions, type *diag* at the AIX command prompt.

36.

When the diagnostic operating instructions are displayed, do the following:

1. Press Enter.
 2. Select the **Task Selection** option.
Note: If the terminal type is not defined, you are prompted to define it before you can proceed.
 3. Select the **Log Repair** option.
 4. Select the resource associated with the repair action. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
 5. Click **Commit** after you have made your selection.
-

37.

Exit from diagnostics in this partition and return to the AIX prompt.

38.

Have all the partitions in the list of "Axx" partitions you began recording in step 14 on page 621 been processed?

Yes

↓

No

Go to step 34 to process the next partition in the list you recorded in step 14 on page 621.

39.

If the system attention LED is still on, turn off the LED as described in **Activating and deactivating LEDs**. This completes the repair. Return the system to the customer.

Note: If during the processing of the list of open service action events, some service action events remained open, further service actions may be required to complete the repair.

"Closing a service call using Integrated Virtualization Manager" on page 625

Perform these procedures to close problem numbers, clear hardware messages, and prepare the server to return to the customer.

"Closing a service call using AIX or Linux" on page 631

If the server is not connected to an HMC and not using IVM, perform these procedures to close problem numbers, clear hardware messages, and prepare the server to return to the customer.

"Activating and deactivating LEDs" on page 636

Use this procedure to activate or deactivate LEDs.

Closing a service call using Integrated Virtualization Manager

Perform these procedures to close problem numbers, clear hardware messages, and prepare the server to return to the customer.

Follow this checklist before performing the procedures:

- Return the server to the state that the customer normally uses such as IPL type, IPL mode, and the way the system is configured or partitioned.

Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.

- While you were performing the problem analysis on the original serviceable event, other serviceable-event numbers might have been opened. Close all serviceable events that were opened as a result of your service activity.
- Ensure that server verification has been performed and there are no problems that require additional service actions.
- If the repair was done using the IVM online repair procedures, ensure that the original serviceable event is now closed.

1.

For future reference, record the SRC or symptom and the location code of the FRU you replaced.

2.

On the IVM, open Manage Serviceable Events and look at existing serviceable events.

3.

Are there any service action events that are open?

Yes

↓

No

If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 636. Return the system to the customer. **This completes the repair.**

4.

Record the list of open service action events.

5.

From the list of serviceable events recorded in step 4, perform step 6 through step 30 on page 629 for each open service action event.

6.

Determine the error class of the serviceable event. Record for future use.

7.

Examine the details of the open service action event.

Is the error code associated with this service action event the same as recorded in Step 1 on page 625?

No	Yes
↓	Go to step 11.

8.

Examine the FRU list of the service action event. Are there any FRUs listed for the service action event?

Yes	No
↓	Go to step 11.

9.

Is the FRU list identical (same FRUs, same number of FRUs, and same order of FRUs) to the FRU list of the error code recorded in step 1 on page 625?

No	Yes
↓	Go to step 11.

10.

The FRU list is different.

Is the FRU you replaced and recorded in step 1 on page 625 in the list of FRUs for this service action event?

Yes	No
↓	Go to step 30 on page 629. Note: There are service action events that will remain open when you leave this MAP. Further service actions may be required to complete the repair.

11.

Examine the details of this service action event, and record the partitions involved in this service action event for use in a later step.

12.

Is the error code associated with this service action event of the form A11-xxx or A01-xxx?

Yes	No
↓	Go to step 17 on page 627.

13.

Have you begun a list of "Axx" partitions from prior service action events that you processed in this MAP?

No

↓

Yes

Go to step 15.

14.

Begin a new list of "Axx" partitions by copying the list of partitions obtained in step 11 on page 626. Go to step 16.

15.

Add the partition list obtained in step 11 on page 626 to the existing list of "Axx" partitions obtained from processing previous service action events in this MAP.

16.

Remove all entries in the list of all partitions you recorded in step 11 on page 626. If you are referred to the list of partitions obtained in step 11 on page 626 in future steps, the list is empty. Go to step 17.

17.

Select and highlight the service action event from the Manage Serviceable Events window.

18.

Click **Close Event**.

19.

Add comments for the serviceable event. Include any unique additional information. Click **OK**.

The following steps will add or update FRU information.

20.

Did you replace, add, or modify a FRU of the open service action event?

Yes

↓

No

Go to step 22.

21.

Click **OK** to close the service action event.

22.

Is the list of all partitions you recorded in step 11 on page 626 empty?

No	Yes
↓	Go to step 30 on page 629.

23.

Does the list of all partitions you recorded in step 11 on page 626 contain more than one entry?

Yes	No
↓	Go to step 30 on page 629.

24.

Is the error class recorded in step 23 AIX?

Yes	No
↓	Go to step 30 on page 629.

25.

Perform the following steps for each entry in the list of all partitions you recorded in step 11 on page 626, except the partition you were using to debug the original problem.

26.

From the IVM virtual terminal window of a partition in the list of all partitions, type *diag* at the AIX command prompt.

27.

When the diagnostic operating instructions are displayed, do the following:

1. Press Enter.
 2. Select the **Task Selection** option.
 3. Select the **Log Repair** option.
 4. Select the resource associated with the repair action. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
 5. Click **Commit** after you have made your selection.
-

Note: If the terminal type is not defined, you are prompted to define it before you can proceed.

28.

Exit from diagnostics in this partition and return to the AIX prompt.

29.

Have all the partitions in the list of all partitions you recorded in step 11 on page 626 been processed?

Yes	No
↓	Go to step 25 to process the next partition in the list you recorded in step 11 on page 626.

30.

Have all the serviceable events recorded in step 4 on page 625 been processed?

Yes

↓

No

Go to step 5 on page 625 and process the next service action event in the list of serviceable events recorded in step 4 on page 625.

31.

While processing all service action events, were you directed to step 14 on page 627?

Yes

↓

No

If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 636. Return the system to the customer. **This completes the repair.**

Note: If during the processing of the list of open service action events, some service action events remained open, further service actions may be required to complete the repair.

32.

Perform the following steps for each entry in the list of “Axx” partitions you began recording in step 14 on page 627, except the partition you were using to debug the original problem.

33.

From the IVM virtual terminal window of a partition in the list of “Axx” partitions, type *diag* at the AIX command prompt.

34.

When the diagnostic operating instructions are displayed, do the following:

1. Press Enter.
 2. Select the **Task Selection** option.
Note: If the terminal type is not defined, you are prompted to define it before you can proceed.
 3. Select the **Log Repair** option.
 4. Select the resource associated with the repair action. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
 5. Click **Commit** after you have made your selection.
-

35.

Exit from diagnostics in this partition and return to the AIX prompt.

36.

Have all the partitions in the list of "Axx" partitions you began recording in step 14 on page 627 been processed?

Yes

↓

No

Go to step 32 on page 629 to process the next partition in the list you recorded in step 14 on page 627.

37.

If the system attention LED is still on, turn off the LED as described in **Activating and deactivating LEDs**. This completes the repair. Return the system to the customer.

Note: If during the processing of the list of open service action events, some service action events remained open, further service actions may be required to complete the repair.

Closing a service call using AIX or Linux

If the server is not connected to an HMC and not using IVM, perform these procedures to close problem numbers, clear hardware messages, and prepare the server to return to the customer.

Follow this checklist before performing the procedures:

- Return the server to the state that the customer normally uses such as IPL type, IPL mode, and the way the system is configured or partitioned.
Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.
- While you were performing the problem analysis on the original serviceable event, other serviceable-event numbers might have been opened. Close all serviceable events that were opened as a result of your service activity.
- Ensure that server verification has been performed and there are no problems that require additional service actions.
- If the repair was done using the IVM online repair procedures, ensure that the original serviceable event is now closed.

1.

Did you use an AIX diagnostics service aid hot-swap operation to change the FRU?

No	Yes
↓	Go to step 4 on page 632

2.

Note: If the system planar or battery has been replaced and you are loading diagnostics from a server over a network, it may be necessary for the customer to set the network boot information for this system before diagnostics can be loaded. The system time and date information should also be set when the repair is completed.

Do you have any FRUs (for example cards, adapters, cables, or devices) that were removed during problem analysis that you want to put back into the system?

No	Yes
↓	Reinstall all of the FRUs that were removed during problem analysis. Go to step 3

3.

Is the system or logical partition that you are performing a repair action on running the AIX operating system?

Yes	No
↓	Go to step 5 on page 632

4.

Does the system or logical partition you are performing a repair action on have AIX installed?

Note: Answer "NO" to this question if you have just replaced a hard disk in the root volume group.

No	Yes
↓	Go to step 7

5.

Run standalone diagnostics from either a CD ROM or from a NIM server.

Note: For instruction on running standalone diagnostics from a CD and not using an HMC, go to "Running the eServer stand-alone diagnostics from CD on a server without an HMC attached" on page 734.

For instruction on running standalone diagnostics from a NIM server, go to "Running the eServer stand-alone diagnostics from a Network Installation Management server" on page 736.

Did you encounter any problems?

No	Yes
↓	Go to Problem Analysis <i>Problem AnalysisSA76-0111</i>

6.

The system hardware is functioning correctly. Return the server to the state that the customer normally uses such as IPL type, IPL mode, and the way the system is configured or partitioned.

Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.

7.

1. If the system supports slow boot (See "Performing a slow boot" on page 722), do a slow boot on the system. If the system does not support slow boot, do a normal boot.
2. Power on the system.
3. Wait until the AIX operating system login prompt displays or until system activity on the operator panel or display apparently has stopped.

Did the AIX Login Prompt display?

Yes	No
↓	Go to <i>Problem AnalysisSA76-0111</i> .

8.

If the **Resource Repair Action** menu is already displayed, go to 12 on page 634; otherwise, do the following:

1. Log into the operating system either with root authority (if needed, ask the customer to enter the password) or use the CE login.
 2. Enter the `diag -a` command and check for missing resources. Follow any instructions that display. If an SRN displays, suspect a loose card or connection. If no instructions display, no resources were detected as missing. Continue on to 9.
-

9.

1. Enter `diag` at the command prompt.
2. Press Enter.
3. Select the **Diagnostics Routines** option.
4. When the DIAGNOSTIC MODE SELECTION menu displays, select **Problem determination**.
5. When the ADVANCED DIAGNOSTIC SELECTION menu displays, select the **All Resources** option or test the FRUs you exchanged, and any devices that are attached to the FRU(s) you exchanged, by selecting the diagnostics for the individual FRU.

Did the RESOURCE REPAIR ACTION menu (801015) display?

No	Yes
↓	Go to step 13 on page 634.

10.

Did the TESTING COMPLETE, no trouble was found menu (801010) display?

Yes	No
↓	There is still a problem. Go to <i>Problem Analysis</i> SA76-0111

11.

Use the Log Repair Action option, if not previously logged, in the TASK SELECTION menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action.

If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.

Note: If the system attention indicator is on, this will set it back to the normal state. Go to step 14 on page 635.

12.

When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the RESOURCE REPAIR ACTION menu displays.

After replacing a FRU, you must select the resource for that FRU from the RESOURCE REPAIR ACTION menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.

Note: If the system attention indicator is on, this action will set it back to the normal state.

Do the following:

1. Select the resource that has been replaced from the RESOURCE REPAIR ACTION menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
2. Press **Commit** after you make your selections.

Did another Resource Repair Action (801015) display?

Yes

↓

No

If the No Trouble Found menu displays, go to step 14 on page 635

13.

The parent or child of the resource you just replaced may also require that you run the RESOURCE REPAIR ACTION service aid on it.

When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the RESOURCE REPAIR ACTION menu displays.

After replacing that FRU, you must select the resource for that FRU from the RESOURCE REPAIR ACTION menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.

Note: If the system attention indicator is on, this action will set it back to the normal state.

Do the following:

1. From the RESOURCE REPAIR ACTION menu, select the parent or child of the resource that has been replaced. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
 2. Press **COMMIT** after you make your selections.
 3. If the No Trouble Found menu displays, go to step 14 on page 635
-

14.

If you changed the service processor or network settings, as instructed in previous MAPs, restore the settings to the value they had prior to servicing the system. If you ran standalone diagnostics from CD-ROM, remove the standalone diagnostics CD-ROM from the system.

Did you perform service on a RAID subsystem involving changing of the PCI RAID adapter cache card or changing the configuration?

Note: This does not refer to the PCI-X RAID adapter or cache.

Yes

↓

No

Go to step 16.

15.

Use the **Recover Options** selection to resolve the RAID configuration. To do this, do the following:

1. On the PCI SCSI Disk Array Manager screen, select **Recovery options**.
 2. If a previous configuration exists on the replacement adapter, this must be cleared. Select **Clear PCI SCSI Adapter Configuration**. Press F3.
 3. On the Recovery Options screen, select **Resolve PCI SCSI RAID Adapter Configuration**.
 4. On the Resolve PCI SCSI RAID Adapter Configuration screen, select **Accept Configuration on Drives**.
 5. On the PCI SCSI RAID Adapter selections menu, select the adapter that you changed.
 6. On the next screen, press Enter.
 7. When you get the Are You Sure selection menu, press Enter to continue.
 8. You should get an OK status message when the recover is complete. If you get a Failed status message, verify that you selected the correct adapter, then repeat this procedure. When recover is complete, exit the operating system.
 9. Go to 16
-

16.

The system hardware is functioning correctly. Return the server to the state that the customer normally uses such as IPL type, IPL mode, and the way the system is configured or partitioned.

Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.

Activating and deactivating LEDs

Use this procedure to activate or deactivate LEDs.

Choose from the following:

- “Deactivate a system attention LED or partition LED using the HMC”
- “Activate or deactivate identify LED using the HMC”
- “Deactivate a system attention LED or partition LED using the ASMI” on page 637
- “Activate or deactivate identify LED using the ASMI” on page 637

Deactivate a system attention LED or partition LED using the HMC

You can deactivate a system attention LED or a logical partition LED. For example, you might determine that a problem is not a high priority and decide to repair the problem at a later time. However, you want to be alerted if another problem occurs, so you must deactivate the system attention LED so that it can be activated again if another problem occurs.

1. In the navigation area, open **Systems management**.
2. Select the server you are working on by checking the box next to its name.
3. Open **Operations**.
4. Open **LED Status**.
5. Select **View System Attention**. The system attention LED window opens. The selected system and its LED state are displayed in the upper part of the window. The logical partition and its LED state are displayed in the lower part of the window. From the system attention LED window, you can deactivate both the system attention LED and the logical partition LED.
6. Select **Deactivate System Attention LED** from the **Action** menu. A confirmation window is displayed that provides the following information:
 - A verification that the system attention LED was deactivated.
 - An indication that there still might be open problems within the system.
 - An indication that you cannot activate the system attention LED.
7. Select one of the logical partitions in the lower table, and select **Deactivate partition LED** from the **Partition Operations** menu. A confirmation window is displayed that provides the following information:
 - A verification that the logical partition LED was deactivated.
 - An indication that there still might be open problems within the logical partition.
 - An indication that you cannot activate the logical partition LED.

Activate or deactivate identify LED using the HMC

The system provides several LEDs that help identify various components, such as enclosures or field replaceable units (FRUs), in the system. For this reason, they are called *Identify LEDs*.

You can activate or deactivate the following types of identify LEDs:

- **Identify LED for an enclosure** If you want to add an adapter to a specific drawer (enclosure), you need to know the machine type, model, and serial number (MTMS) of the drawer. To determine whether you have the correct MTMS for the drawer that needs the new adapter, you can activate the LED for a drawer and verify that the MTMS corresponds to the drawer that requires the new adapter.
- **Identify LED for a FRU associated with a specified enclosure** If you want to hook up a cable to a specific I/O adapter, you can activate the LED for the adapter which is a field replaceable unit (FRU), and then physically check to see where you should hook up the cable. This is especially useful when you have several adapters with open ports.

To activate or deactivate an identify LED for an enclosure or FRU, follow these steps:

1. In the navigation area, open **Systems management**.
2. Select the server you are working on by checking the box next to its name.
3. Open **Operations**.
4. Open **LED Status**.
5. Select **Identify LED**. The Identify LED, Select Enclosure window opens.
6. To activate or deactivate an identify LED for an enclosure, select an enclosure from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.
7. To activate or deactivate an identify LED for a FRU, select an enclosure from the table, select **Selected** → **List FRUs**.
8. Select one or more FRUs from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.

Deactivate a system attention LED or partition LED using the ASMI

The system attention indicator provides a visual signal that the system as a whole requires attention or service. Each system has a single system attention indicator. When an event occurs that either needs your intervention or that of service and support, the system attention indicator lights continuously. The system attention indicator is turned on when an entry is made in the service processor error log. The error entry is transmitted to the system level and operating system error logs.

To perform this operation, your authority level must be one of the following:

- Administrator
- Authorized service provider

To turn off the system attention indicator, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration** and **Service Indicators**.
3. Select **System Attention Indicator**.
4. In the right pane, click **Turn off system attention indicator**. If the attempt is unsuccessful, an error message is displayed.

Activate or deactivate identify LED using the ASMI

You can specify the location code of any indicator to view or modify its current state. If you provide the wrong location code, the advanced system manager attempts to go to the next higher level of the location code.

The next level is the base-level location code for that field replaceable unit (FRU). For example, a user types the location code for the FRU located on the second I/O slot of the third enclosure in the system. If the location code for the second I/O slot is incorrect (the FRU does not exist at this location), an attempt to set the indicator for the third enclosure is initiated. This process continues until a FRU is located or no other level is available.

To perform this operation, your authority level must be one of the following:

- Administrator
- Authorized service provider

To change the current state of an indicator, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration** and **Service Indicators**.
3. Select **Indicators by Location code**.

4. In the right pane, enter the location code of the FRU and click **Continue**.
5. Select the preferred state from the list.
6. Click **Save settings**.

Chapter 7. Common Service Procedures

This chapter contains procedures that may be common to various isolation and repair procedures.

1. "Powering on and powering off" on page 641
Provides information for powering on and powering off the system.
2. "Determining a primary or alternative console" on page 644
The *primary* console is the first workstation that the system identifies. It is attached to the first input/output adapter (IOA) or input-output processor (IOP) that supports workstations. The *alternative* console is the workstation that functions as the console when the primary console is not operational.
3. "Determining if the system has logical partitions" on page 646
4. "Separating the 571F/575B card set and moving the cache directory card" on page 647
5. "Determining which Processor is the Secondary Service Processor" on page 653
Use this procedure to determine which service processor on your system is the secondary service processor.
6. "The System Reference Code (SRC) Format Description" on page 654
The format of the SRC that you see depends on the system or server.
7. "Using the Service Action Log" on page 663
Use this procedure to search for an entry in the Service Action Log (SAL) that matches the time, reference code, or resource of the reported problem.
8. "System Service Tools (SST)" on page 665
9. "More information from hexadecimal reports" on page 671
You can get additional information for IOP 90xx reference code product activity log entries at DST by using a D-IPL.
10. "Hexadecimal Product Activity Log data" on page 687
Use the *Display Hexadecimal Report Function* or follow the steps below to display hexadecimal error log dump data.
11. "Reclaiming IOP cache storage" on page 690
12. "Working with Storage Dumps" on page 691
13. "Dedicated Service Tools (DST)" on page 692
14. "Printing the System Configuration List" on page 699
15. "Hardware Service Manager" on page 701
16. "Managing the Advanced System Management Interface (ASMI)" on page 702
Understand how to manage the Advanced System Management Interface (ASMI).
17. "Service functions" on page 709
Service functions provides enough detail for the service provider to gather information about hardware problems while under the direction of the next level of support.
18. "Managing dumps" on page 710
After you have performed a dump, or one occurs automatically, use this information to manage the dump, including copying, reporting, and deleting it.
19. "Performing an IBM i5/OS main storage dump" on page 720
A main storage dump is a collection of data from the i5/OS's main storage. It can be manually initiated when the system administrator suspects a system wait or loop, or automatically by the server firmware as the result of a system failure.
20. "Performing a slow boot" on page 722
Learn how to perform a slow boot using the HMC, control panel, or ASMI menus depending on your configuration.
21. "Determining the primary or alternate console" on page 724
Use this procedure to determine the primary or alternate console.

22. “Resetting the service processor” on page 726
Use this procedure to reset the service processor.
23. “Resetting the managed system connection from the HMC” on page 727
Use this procedure to reset the managed system connection from the HMC.
24. “Checking for a duplicate IP address” on page 728
Use this procedure to check for a duplicate IP address.
25. “Running the online and eServer stand-alone diagnostics” on page 729
Use these tools to diagnose hardware problems on your AIX or Linux systems or partitions.
26. “Performing an IBM i5/OS main storage dump” on page 720
A main storage dump is a collection of data from the i5/OS’s main storage. It can be manually initiated when the system administrator suspects a system wait or loop, or automatically by the server firmware as the result of a system failure.

Powering on and powering off

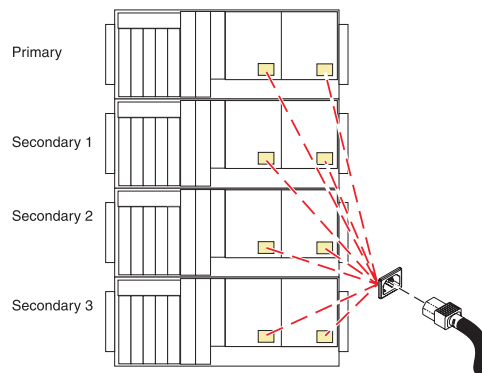
Provides information for powering on and powering off the system.

Attention: If possible, shut down all applications and partitions before powering off the system. Using either the power-on button on the control panel or entering commands at the Hardware Management Console (HMC) to stop the system can cause unpredictable results in the data files. Also, the next time you start the system, it might take longer if all applications are not ended before stopping the system.

Install the power cords

Note: Before powering on a system, ensure that the power cords have been plugged in to all of the power supplies on all of the processor enclosures. Install the cords in the following order:

- Secondary 2
- Secondary 3
- Primary
- Secondary 1



Power on a system using an HMC

To power on a managed system, complete the following steps:

1. In the Navigation area, expand the **Systems Management** icon.
2. Expand the **Servers** icon.
3. Choose the check box next to the name of the desired server. The tasks available for that server will be enabled.
4. From the **Tasks** drop down menu, choose **Operations** -> **Power on**. Follow any additional on-screen instructions.

Power on a system without an HMC

To start a system that is not managed by an HMC, follow these steps: Press the power button A, as shown in the following figure, on the control panel. Observe the following after pressing the power button: The power-on light begins to blink visibly faster. The system cooling fans are activated after approximately 30 seconds and begin to accelerate to operating speed. Progress indicators, also referred to as checkpoints, appear on the control panel display while the system is being started. The power-on light on the control panel stops blinking and remains on, indicating that system power is on.

1. On a rack-mounted system unit, open the front rack door, if necessary. On a stand-alone system unit, open the front door.
2. Before you press the power button on the control panel, ensure that power is connected to the system unit as follows:
 - All system power cables are connected to a power source.
 - The power-on light F, as shown in the following figure, is slowly blinking.
 - The top of the display D, as shown in the following figure, contains 01 V=F.

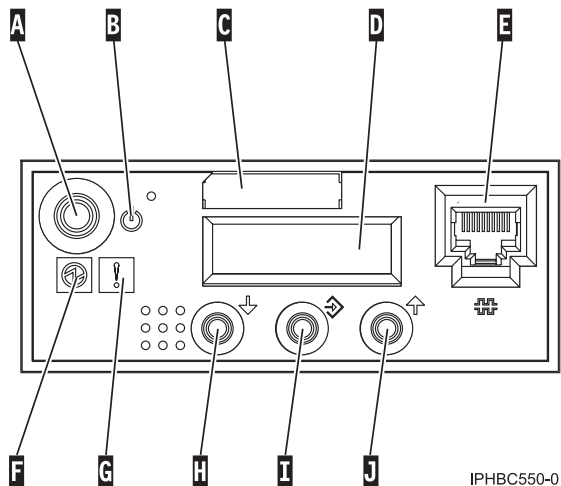


Figure 54. Control Panel with labels

3. Press the power button A, as shown in the following figure, on the control panel.
4. Observe the following after pressing the power button:
 - The power-on light begins to blink visibly faster.
 - The system cooling fans are activated after approximately 30 seconds and begin to accelerate to operating speed.
 - Progress indicators, also referred to as checkpoints, appear on the control panel display while the system is being started. The power-on light on the control panel stops blinking and remains on, indicating that system power is on.

Power off a system using an HMC

Attention: If possible, shut down the running logical partitions on the managed system before powering off the managed system. Powering off the managed system without shutting down the logical partitions first causes the logical partitions to shut down abnormally and can cause data loss.

1. In the Navigation area, expand the Systems Management icon.
2. Expand the Servers icon.
3. Choose the check box next to the name of the desired server. A selection of tasks available for that server will be displayed.
4. From the Tasks drop down menu, choose Operations -> Power off. Follow any additional on-screen instructions.
5. Continue with "Remove the power cords" on page 643

Power off a system without an HMC

1. If there is an operating system running, proceed with step 2. Otherwise, press the power button A, as shown in Figure 54. The system power turns off. Proceed to step 4
2. Log in to the system as a user with the authority to run the shutdown command.
3. At the command line, enter one of the following commands:
 - If your system is running AIX, type shutdown.
 - If your system is running Linux, type shutdown -h now.

The command stops the operating system. The system power turns off.

4. The power-on light begins to slowly blink, and the system goes into a standby state.

5. Continue with “Remove the power cords.”

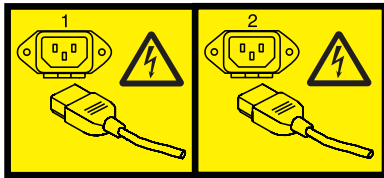
Remove the power cords

Table 42.

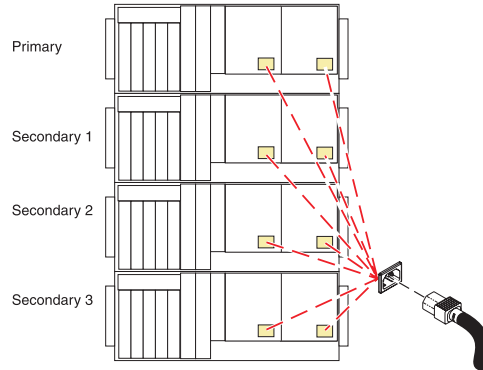
Unplug any power cables that are attached to the unit from electrical outlets. Remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.

Important: The system might be equipped with a second power supply. Before continuing with this procedure, ensure that all power sources to the system have been completely disconnected.

(L003)



or



Determining a primary or alternative console

The *primary* console is the first workstation that the system identifies. It is attached to the first input/output adapter (IOA) or input-output processor (IOP) that supports workstations. The *alternative* console is the workstation that functions as the console when the primary console is not operational.

A console is a workstation that allows you to view and control system operations. The *primary* console is the first workstation that the system identifies. It is attached to the first input/output adapter (IOA) or input-output processor (IOP) that supports workstations. The *alternative* console is the workstation that functions as the console when the primary console is not operational. The system can assign up to two alternative consoles. The first alternative console can only be a twinaxial workstation that is attached to the same IOP as the primary console. The next alternative console is a workstation that is attached to the next IOA or IOP that is capable of supporting workstations.

The IOA or IOP that supports a console must be on the system bus (bus 1).

If a workstation is not correctly attached to the first IOA or IOP that is capable of attaching workstations, the system will not assign a primary console. If it does not assign a primary console, the system displays a reference code on the control panel. If the system is set for Manual mode, it stops during the IPL.

For more information on how to determine the primary and alternative consoles, see “Identifying the consoles when the system is operational.”

Primary console requirements

For a workstation to be the primary console, it must be operational and attached to the system bus. It must also have the correct port and address assigned. If the workstation is a personal computer, it must also have an active workstation emulation program.

The workstation requirements are:

- Twinaxial workstation
 - Port 0, Address 0, Bus 1
- ASCII workstation
 - Port 0, Bus 1
- Personal computer attached to ASCII IOP
 - Port 0, Bus 1
 - Personal computer software to emulate a 316x or 3151 terminal
- Personal computer attached to Twinaxial IOP
 - Port 0, Address 0, Bus 1
 - 5250 emulator software active on personal computer

For more information on how to determine the primary and alternative consoles, see “Identifying the consoles when the system is operational.”

Identifying the consoles when the system is operational

When the system is operational, you can determine the primary and alternative consoles by performing one of the following:

- Look at the display.
 - If the dominant operating system is i5/OS, look for a sign-on display that shows DSP01 in the upper right corner. DSP01 is the name that the system assigns to the primary console.

Note: This resource name might have been changed by the customer.

- Use system commands to assist in identifying the consoles. See the system operation information for more details on commands.
- Use the Hardware Service Manager function to assist in identifying the consoles:
 1. Select the *System bus resources* option on the *Hardware Service Manager* display. The *System Bus Resources* display allows you to view the logical hardware resources for the system bus.
Look for a (<) symbol next to an IOP. The (<) symbol indicates that the console attaches to this IOP.
 2. Select the *Resources associated with IOP* and the *Display detail* options to collect more information about the consoles.

Determining if the system has logical partitions

This procedure will help you determine if the system has logical partitions.

1. Is the system managed by an **HMC**?

Yes: Continue with the next step.

No: The system does not have logical partitions. You must have an **HMC** to have logical partitions. Return to the procedure that sent you here. **This ends the procedure.**

2. Determine if the system has multiple logical partitions by performing the following from the **HMC**:
 - a. Expand the **Systems Management** folder in the Navigation area.
 - b. Expand the **Servers** folder.
 - c. Click the name of the managed system you are working with. The partitions will be displayed.

Is there more than one logical partition listed?

No: The system does not have multiple logical partitions. Return to the procedure that sent you here. **This ends the procedure.**

Yes: The system has multiple logical partitions. Return to the procedure that sent you here. **This ends the procedure.**

Separating the 571F/575B card set and moving the cache directory card

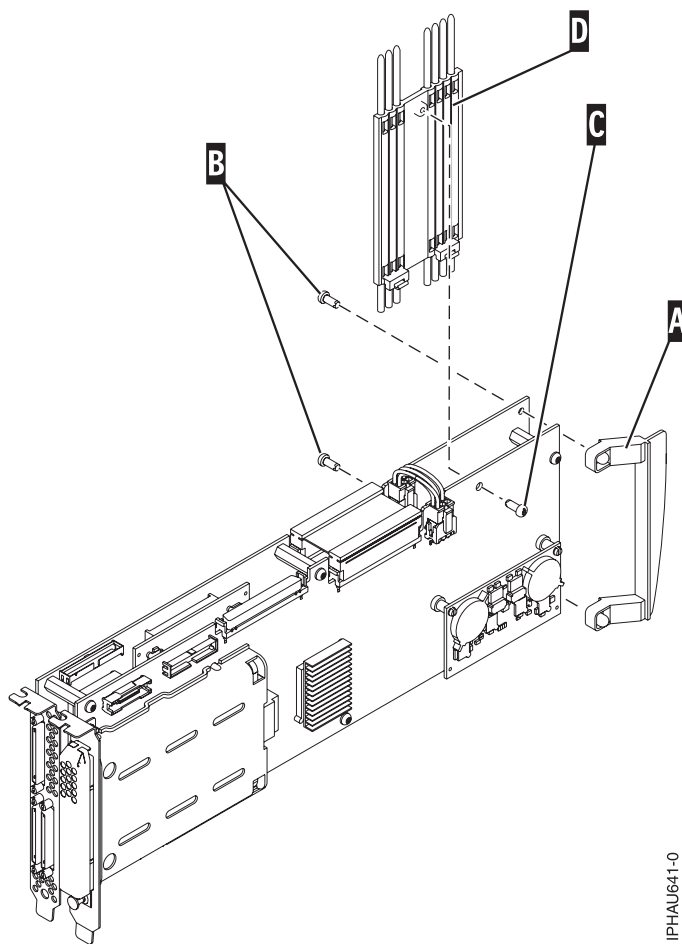
To complete this procedure, you will need a T-10 TORX bit or driver.

Attention: To avoid loss of cache data, you *must not* remove the cache battery during this procedure.

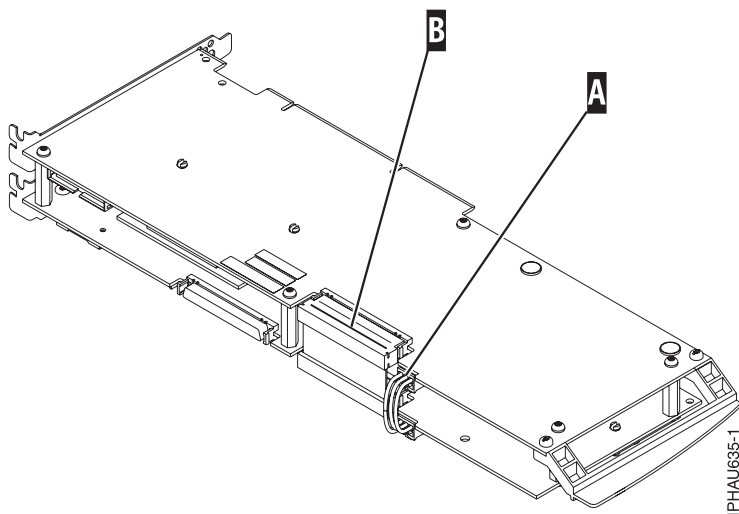
To separate the 571F/575B card set and move the cache directory card, do the following:

Important: All cards are sensitive to electrostatic discharge.

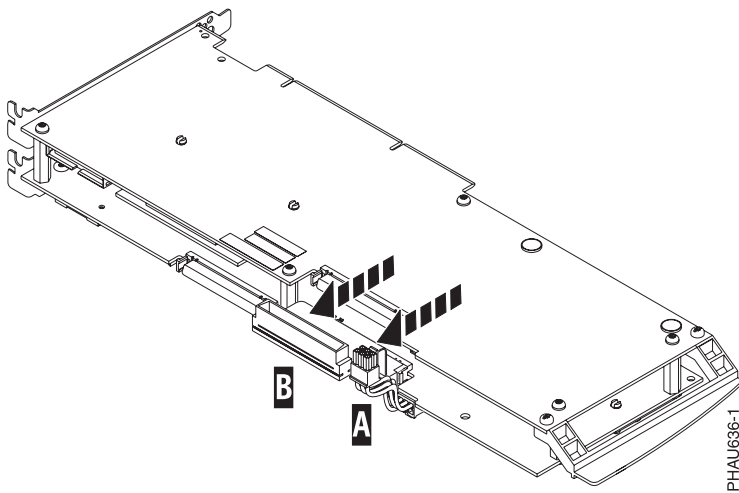
1. Label both sides of the card before separating.
2. Go to the next step if you are not servicing a 571F/575B card set containing a light pipe assembly. If you are servicing a 571F/575B card set that contains a light pipe assembly, you will need to remove the light pipes. To remove the light pipes, do the following:
 - a. Place the 571F/575B card set adapter on an ESD protective surface.
 - b. Remove the light pipe retaining screw **C** from the 571F/575B card set.
 - c. Slide the light pipe assembly **D** from between the 571F/575B cards.
 - d. Put both the screw and the light pipe assembly in a safe place.



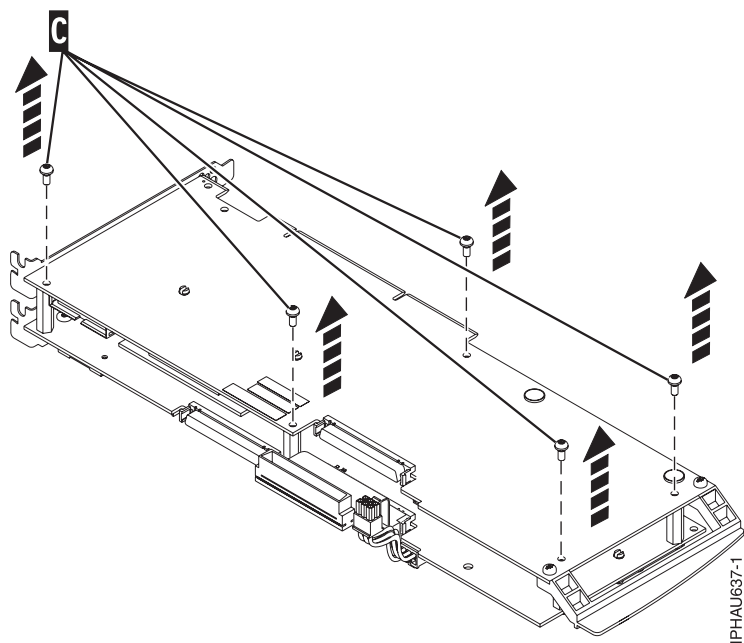
3. Place the 571F/575B card set adapter on an ESD protective surface and orient it as shown.



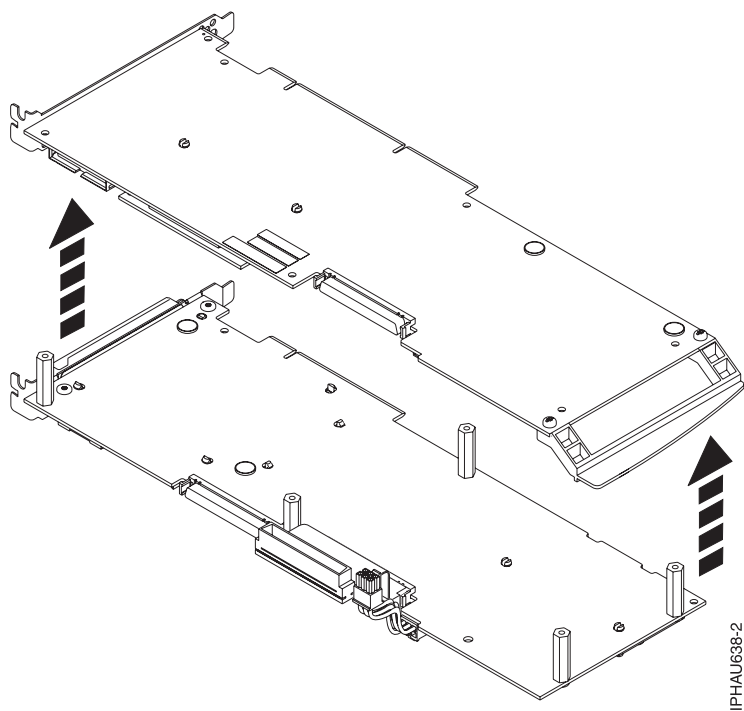
4. Disconnect battery cable **A** and SCSI cable **B** from the 571F storage adapter. Leave the other end of the cables attached to the 575B auxiliary cache adapter.



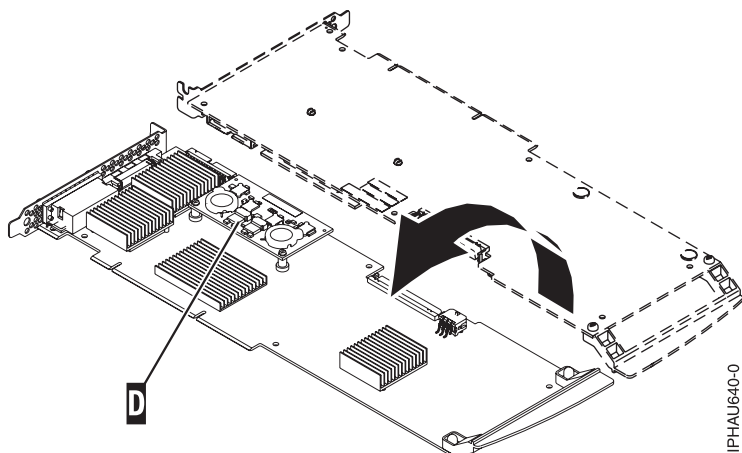
5. To prevent possible card damage, first loosen all 5 retaining screws **C** BEFORE removing them. After all five retaining screws have been loosened, remove the screws **C** from the 571F storage adapter.



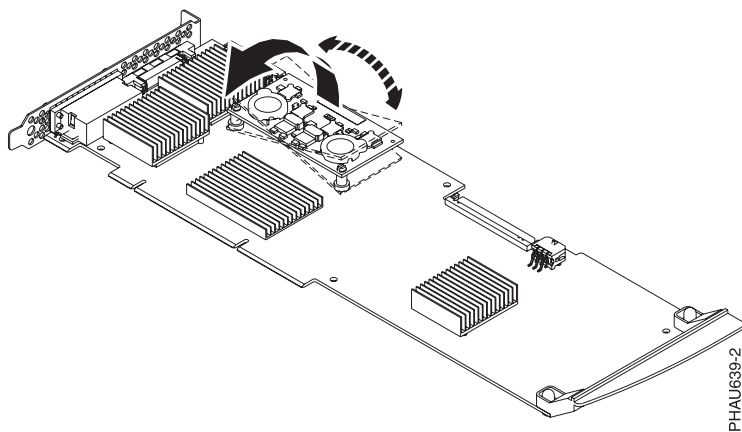
6. Carefully lift the 571F storage adapter off the standoffs and set it on the ESD protective surface.



7. Turn the 571F storage adapter over so the components are facing up and locate the cache directory card **D** on the 571F storage adapter. It is the small rectangular card mounted on the I/O card.



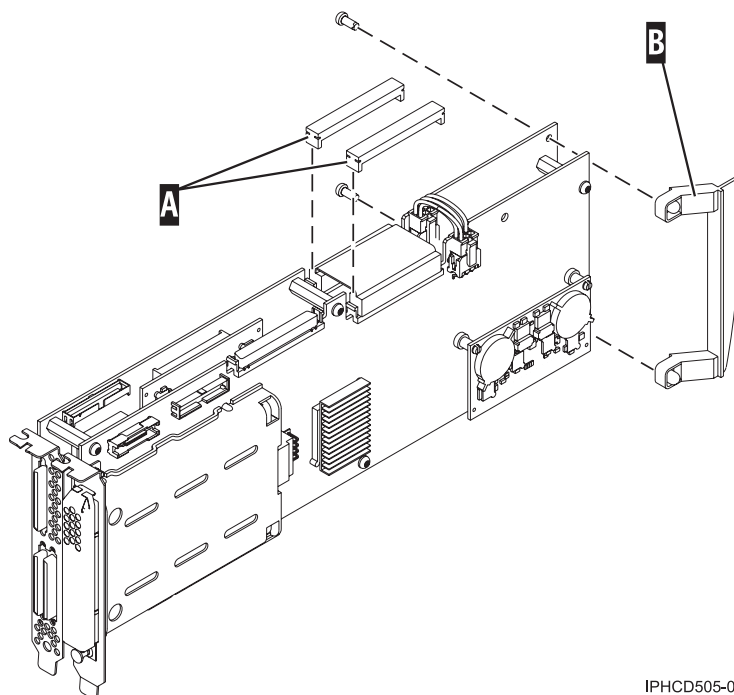
8. Unseat the connector on the cache directory card by wiggling the two corners that are farthest from the mounting pegs. To disengage the mounting pegs, pivot the cache directory card back over the mounting peg.



9. Move the cache directory card to the replacement 571F storage adapter and seat it on the connector and mounting pegs.
10. To reassemble the cards do the above procedure in reverse order. To prevent possible card damage, insert all 5 screws **C** before tightening any of them.

Note: If you are installing the 571F/575B card set adapter into a cassette, do the following:

- a. Remove the adapter handle **B** as shown in the following illustration.
- b. If applicable, remove the light-pipe assembly.
- c. Remove the two plastic covers from the SCSI jumper cable **A** as shown in the following figure:

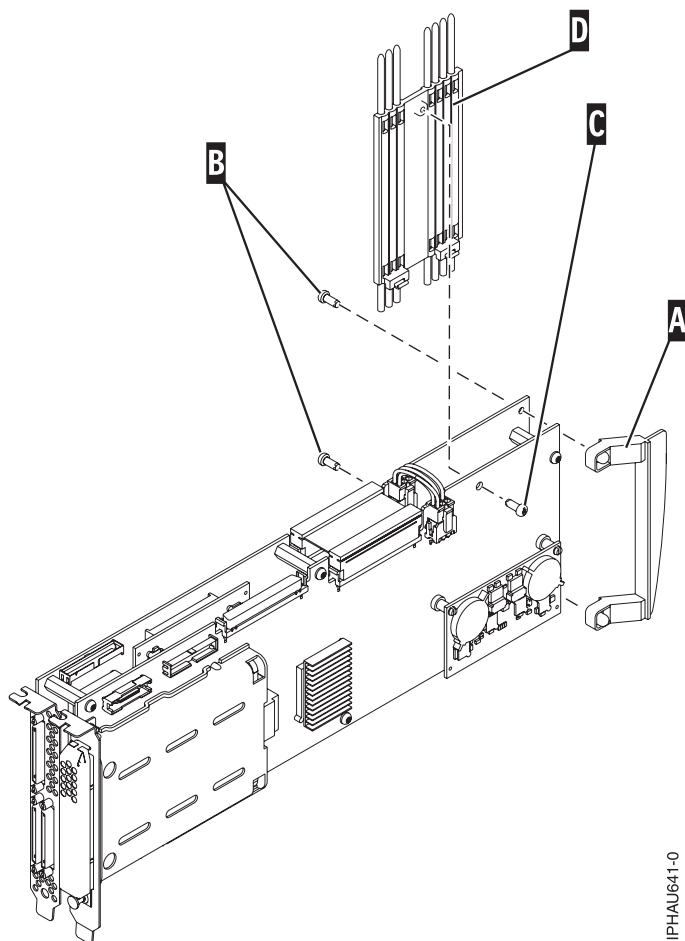


IPHCD505-0

- d. Ensure that battery cable **A** and SCSI cable **B** are reconnected to the 575B auxiliary cache adapter.
 - e. Go to Place an adapter in the PCI adapter double-wide cassette to complete the installation.
11. If applicable, to replace the light pipes, do the following:
 - a. Ensure that the 571F/575B cards are correctly assembled.
 - b. If necessary, remove the 571F/575B card handle **A** from the back of the card set.

Tip: If you misplace the light-pipe retaining screw **C**, use either of the screws that secure the card handle **B** to the card.

 - c. Slide the light pipe assembly **D** between the 571F/575B cards. Ensure that the threaded screw hole located on the light pipe assembly is aligned with the screw clearance hole located on the card .



IPHAU641-0

12. Return to the procedure that sent you here. **This ends this procedure.**

Determining which Processor is the Secondary Service Processor

Use this procedure to determine which service processor on your system is the secondary service processor.

1. Locate the HMC1 and HMC2 port pairs for service processor zero and for service processor one. (See Chapter 3, "Locating FRUs," on page 347 for your specific model.)
2. Is only one service processor with cables attached to its HMC ports?

No: Continue to the next step.

Yes: The secondary service processor is the service processor with no cables attached to the HMC ports. **This ends the procedure.**

3. Use the HMC to access Advanced System Management Interface (ASMI) to determine which service processor is the secondary service processor. First, verify ASMI connectivity by logging onto ASMI. Then pull all HMC cables from HMC ports for service processor zero (leaving service processor one HMC cables attached).

Log onto ASMI again. Were you successfully able to log onto ASMI?

No: The service processor with HMC cables still attached is the secondary service processor. Reattach the HMC cable(s) to service processor zero. **This ends the procedure.**

Yes: The cables just removed identify the secondary service processor. Reattach the HMC cables to the secondary service processor. **This ends the procedure.**

The System Reference Code (SRC) Format Description

The format of the SRC that you see depends on the system or server.

“System Reference Code (SRC) Information”

Helps you understand how SRCs work.

“System reference code (SRC) address formats”

Use this procedure to determine the IOP, IOA, or device address from either a control panel or a console display.

“Hardware SRC formats” on page 658

SRC format examples.

System Reference Code (SRC) Information

Helps you understand how SRCs work.

Use this information to understand how SRCs work.

The system reference code (SRC) is a sequence of data words (codes) that:

- Identifies a system status
- Describes a detected hardware, Licensed Internal Code (LIC), or software failure
- Describes the unit that is reporting the failure and its location

SRCs can display on the control panel, appear in a system console message, or appear in the product activity log.

The system uses the following procedure to gather information about errors:

1. The system gathers information about an error as the system detects the error.
2. The Product Activity Log (PAL) records and stores the error information.
3. An SRC encodes information used to evaluate or identify a system-detected hardware or software error, failure, or status. The failure information may include the failing condition or part (or unit) that can be exchanged or replaced and its location.
4. The SRC links to the problem determination procedure when the element detecting the failure cannot isolate the failing condition.
5. The SRC link completes the isolation process.

In summary, the SRC provides the first-failure-data-capture information. The customer or support representative uses SRCs during problem determination, repair actions, and verification. The SRC provides a link to the problem determination procedures (hardcopy or softcopy). Use the SRC and the problem determination procedures to isolate the problem.

System reference code (SRC) address formats

Use this procedure to determine the IOP, IOA, or device address from either a control panel or a console display.

Use this procedure to determine the IOP, IOA, or device address from either a control panel or a console display.

1. Was the SRC and addressing information obtained either from a control panel display, the Main Storage Dump Manager display, or the HMC Partition Properties Reference Code words display?
 - **No:** Continue with the next step.
 - **No:** Contact your next level of support. **This ends the procedure.**
 - **Yes:** Addressing information is in the Bus-Bus-Bus-Bus/Card-card/board-board (BBBBCCbb) format as follows:

- If characters 7 and 8 of the top 16-character line of function 12 (word two) are 60:
 - The direct select address is characters 1-8 of the bottom 16-character line of function 12 (word four) in the format "BBBBCcbb".
 - The device address is characters 9-16 of the bottom 16-character line of function 12 (word five) in the format "abcd efgh".
- If characters 7 and 8 of the top 16-character line of function 12 (word two) are 13, 17, 27, or 29:
 - The direct select address is characters 9-16 of the top 16-character line of function 12 (word three) in the format "BBBBCcbb".
 - The device address is characters 1-8 of the bottom 16-character line of function 12 (word four) in the format "abcd efgh".
- If characters 7 and 8 of the top 16-character line of function 12 (word two) are 62:
 - The direct select address may be characters 9-16 of the top 16-character line of function 13 (word seven) in the format "BBBBCcbb".
 - The device address may be characters 1-8 of the top 16-character line of function 13 (word six) in the format "abcd efgh".

Go to step 9 on page 657.

2. Are you using the HMC?

No: Continue with the next step.

Yes: Open the server with the problem, then go to the i5/OS partition with the problem and use the Service Action Log (SAL) to find the entry related to this problem (see "Using the Service Action Log" on page 663), and then go to step 7 on page 656.

3. Are you using the Service Action Log (SAL)?

No: Continue with the next step.

Yes: Go to step 7 on page 656.

4. Are you using i5/OS communication-diagnostic panels that are displayed by the commands VFYCMN, WRKPRB, or ANZPRB?

Yes: Go to step 11 on page 658.

No: Continue with the next step.

5. Addressing information is in the Bus/Board/Card format.

Note: This format shows the system bus number in decimal form.

If no address information is available in the console error message, check the Product Activity Log (PAL) entry that is associated with the console error message. Below is an example of a PAL display for a storage device. Other devices (for example, workstations or communications) have similar displays. For more information about the PAL, see "Using the product activity log" on page 76 in the "Service functions" on page 709.

Figure 55. Product Activity Log display example

Display Address Information for Resource				
Name	Type	Model	Serial Number	Resource Name
STORAGE	6718	050	83-00834	DD001
Physical Location:				
U7879.001.10ABCDE-P3-D3				
Logical Address:				

PCI Bus:		Storage:	
System Bus :	3	I/O Adapter :	2
System Board :	0	I/O Bus :	1
System Card :	32	Controller. :	4
		Device :	0

In the above example, the contents of "Storage" are defined as follows.

Table 43. Storage definitions

Reference	Description
I/O Bus	This is the bus to which the device is connected.
I/O Adapter	This is the adapter that the I/O bus connects to on the I/O processor. Note: For SAS I/O adapters, this field is not applicable.
Controller	This is the logical controller for the addressed device.
Device	This is the <i>logical</i> device that is attached to the <i>logical</i> device controller.

- Use the figure below to understand how addresses in the Bus/Board/Card format relate to the Bus-Bus-Bus-Bus/Card-Card/Board-Board format. You can also use it to understand how addresses in the Bus/Board/Card format relate to the direct select addresses used in Chapter 3, "Locating FRUs," on page 347.

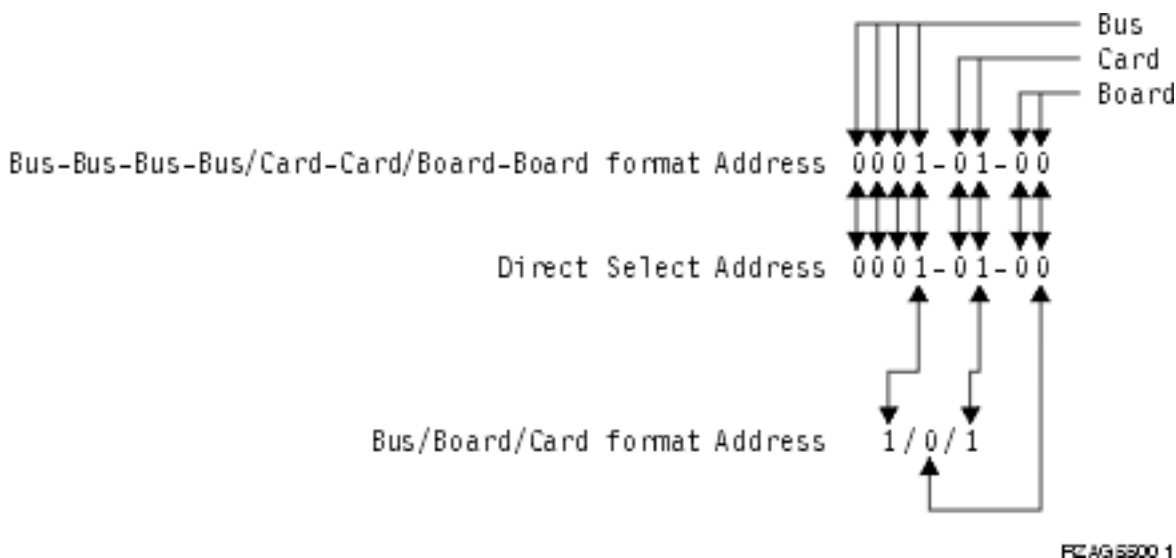


Figure 56. Format conversion

Note: When converting from Bus/Board/Card format to Bus-Bus-Bus-Bus/Card-Card/Board-Board format, the numbers must be converted from Decimal to Hexadecimal.

Go to step 10 on page 657 for IOA and device address information.

- Display the FRU details for the problem that you are attempting to fix. The location information in the field-replaceable unit detail is only available for IOPs, IOAs, and devices.

Is the FRU an IOP, IOA, or device, *and* is there location information in the Location field of the display?

No: Continue with the next step.

Yes: Use the location information and return to the procedure that sent you here. **This ends the procedure.**

- There is no location information in the Location field. Are there additional words displayed at the top of the screen?

- **No:** Go to “Hexadecimal Product Activity Log data” on page 687 in “Service functions” on page 709 to obtain the address information. Then return here and continue with the next step.
- **Yes:** Use the additional words to find the address information:
 - If characters 7 and 8 of word two are 60:
 - The direct select address is word four in the format “BBBBCcbb”.
 - The device address is word five in the format “abcd efgh”.
 - If characters 7 and 8 of word two are 13, 17, 27, or 29:
 - The direct select address is word three in the format “BBBBCcbb”.
 - The device address is word four in the format “abcd efgh”.
 - If characters 7 and 8 of word two are 62:
 - The direct select address may be word seven in the format “BBBBCcbb”.
 - The device address may be word six in the format “abcd efgh”.

Continue with the next step.

9. The BBBBCcbb format is the hexadecimal direct select address of a card location in the system unit. The format definition is:

- BBBB—System Bus
- Cc—System Card
- bb—System Board

Continue with the next step for IOA and device address information.

10. Unit (Device) Address Definitions are explained in an “abcd efgh” format. For example, if the unit address is 0001 00FF, the address relates to the “abcd efgh” format as follows:

```

0 0 0 1    0 0 F F
(a b c d    e f g h)

```

Figure 57. Example of Unit (Device) Address definitions

The characters “abcd efgh” can have different meanings, depending on the subsystem that reports the problem. However, they define the information that is contained in the unit (device) address as follows.

Table 44. Character definitions

SCSI attached disk, tape, or optical	
a	I/O adapter
b	I/O bus
cd	Controller
ef	Device
gh	FF
SAS attached disk, tape, or optical	
Not Applicable	I/O adapter
ab	I/O bus
cd	Controller
ef	Device
gh	FF
Communications	
a	I/O bus
b	Adapter

Table 44. Character definitions (continued)

SCSI attached disk, tape, or optical	
c	0
d	Port
e	0
f	Channel
GH	FF
Workstation	
a	I/O Bus
b	Adapter
cd	Port
e	0
f	Device
g	0
h	Session

11. i5/OS communication-diagnostic panels that are displayed by the commands VFYCMN, WRKPRB, and ANZPRB use the following address format:

x1 x2 x3x4

Table 45. Decimal address values

Value	Description
x1 = System bus	The one, two, or three digit decimal representation of the hexadecimal Bus value of the Bus-Bus-Bus-Bus/Card-Card/Board-Board format Address at the top of Figure 56 on page 656.
x2 = System board	The one or two digit decimal representation of the hexadecimal Board value of the Bus-Bus-Bus-Bus/Card-Card/Board-Board format Address at the top of Figure 56 on page 656.
x3 = System card	The one or two digit decimal representation of the hexadecimal Card value of the Bus-Bus-Bus-Bus/Card-Card/Board-Board format Address at the top of Figure 56 on page 656.
x4 = Adapter location	The one or two digit decimal representation of the hexadecimal b Adapter value of the Communications unit address value in step 9 on page 657 (See step 10 on page 657).

12. Return to the procedure that sent you here. **This ends the procedure.**

Note: See “Hardware SRC formats” for more formatting information.

Hardware SRC formats

SRC format examples.

Notes:

1. Other formats exist; if necessary contact your next level of support.
2. For more information on formats 60–63, see “LIC-Detected Problem Reference Code Formats” on page 661.

Table 46. SRC format examples

SRC Word Number	Panel function, digits x to y (from left to right)	IOP SRC format 13	IOP SRC format 17	Device SRC format 27	IOP detected a failure format 29	LIC SRC Format 60	LIC SRC format 61	LIC SRC format 62	LIC SRC format 63
1	11, 1-8	TTTT RRRR	TTTT RRRR	tttt rrrr	B0XX RRRR	A6xx RRRR	B6xx RRRR	B6xx RRrr or B7xx Rrrr	A600 RRRR
2	12, 1-8	MIGV EP13	MIGV EP17	MIGV EP27	MIGV EP29	MIGV EP60	MIGV EP61	MIGV EP62	MIGV EP63
3	12, 9-16	BBBB Ccbb	BBBB Ccbb	BBBB Ccbb	BBBB Ccbb	PPPP 0000	cccc cccc	cccc cccc	AAAA BBBB
4	12, 17-24	aaaa aaaa	aaaa aaaa	aaaa aaaa	SAPP UUFF	BBBB Ccbb	pppp pppp	pppp pppp	CCCC DDDD
5	12, 25-32	TTTT LMMM	TTTT LMMM	tttt lmmm	TTTT FMMV	aaaa aaaa	qqqq qqqq	qqqq qqqq	EEEE FFFF
6	13, 1-8	uuuu uuuu	tttt lmmm	TTTT LMMM	tttt lmmm	tttt mmmm	qqqq qqqq	qqqq qqqq	GGGG HHHH
7	13, 9-16	uuuu uuuu	ZZZZ rrrr	ZZZZ RRRR	zzzz rrrr	ssss ssss	0000 0000	BBBB Ccbb	JJJJ KKKK
8	13, 17-24	uuuu uuuu	ssss ssss	ssss ssss	0sss ssss	NNNN 0000	0000 0000	TTTT MMMM	TTTT OMMM
9	13, 25-32	uuuu uuuu	uuuu uuuu	uuuu uuuu	uuuu uuuu	0000 0000	0000 0000	0000 0000	SSSS SSSS

Table 47. SRC format examples (continued)

SRC format	Description
AAAA	Type of I/O Bus (see “Logical address format” on page 660 — field ‘A’).
aaaa	Unit address.
BBBB	System Bus Number (see “Logical address format” on page 660 — field ‘B’).
BBBBCcbb	Bus, bus, bus, bus, card, card, and board, board address (Direct Select Address or DSA). <ul style="list-style-type: none"> For PCI system buses 0001-0003 and 0018-FFFF the Cc field is a one digit multi-adapter bridge number and a one digit multi-adapter bridge function number. For SPD system buses 0004-0017 the Cc field is a two digit card number.
CCCC	System Board Number (see “Logical address format” on page 660 — field ‘C’).
cccc cccc	Component reference code. Format 62 varies by component.
DDDD	System Card Number (see “Logical address format” on page 660 — field ‘D’).
EEEE	(see “Logical address format” on page 660 — Unit Address type — field ‘E’).
FFFF	(see “Logical address format” on page 660 — Unit Address type — field ‘F’).
GGGG	(see “Logical address format” on page 660 — Unit Address type — field ‘G’).
HHHH	(see “Logical address format” on page 660 — Unit Address type — field ‘H’).
JJJJ	(see “Logical address format” on page 660 — Unit Address type — field ‘J’).
KKKK	(see “Logical address format” on page 660 — Unit Address type — field ‘K’).
LMMM	Level indicator plus 3” digit model number (for example, 0001).

Table 47. SRC format examples (continued) (continued)

SRC format	Description
Immm	Level indicator plus 3" digit model number of failing device.
OMMM	Model number of failing device (i.e. MMM='001').
MIGV EP	General system status.
NNNN	Number of disk device facilities that are missing.
PPPP	Cause code.
pppp pppp	Programming reference code.
qqqq qqqq	Programming reference code qualifier.
RRRR	Unit reference code (URC).
rrrr	Outboard failing unit reference code (URC).
SAPP UUFF	Unit address.
SSSSSSSS	System Reference Code — this SRC is used to determine why the primary console failed to respond.
ssss	Serial number of failing unit.
TTTT	Type number or card identification number (hex).
tttt	Outboard failing unit type number (i.e. 6607).
uuuu	Unit-specific data.
ww	SRC type.
ZZZZ	Reserved.

“Logical address format”

Use the logical address to identify the resource entry.

“LIC-Detected Problem Reference Code Formats” on page 661
Reference code formats.

Logical address format

Use the logical address to identify the resource entry.

Use the logical address to identify the resource entry. To sort by logical address, select the *Analyze log* option on the Product Activity Log display. Then select the F9 key (Sort by...) and sort by logical address. For more information on the address, use the address information function.

The logical address format, A/B/C/D-E/F/G/H/J/K, has the following definitions:

- A** Type of I/O bus (transport)
- B** System bus number
- C** System board number (for busses that connect card enclosures)
- D** System card (bus unit) number
- Separates the bus address from the unit address
- E** Unit address type
- FGHJK**
Unit address data

The values of F, G, H, J, and K vary, depending on the unit address type (E). Use the following information to determine the Unit address data (FGHJK) representation.

Table 48. Unit address (E) definitions

Unit Address Value	Unit Address Definition	Unit Address Data				
E		F	G	H	J	K
0	Reserved	-	-	-	-	-
1	Communications	I/O bus	Adapter	Port	Channel	-
2	Storage	I/O adapter	I/O bus	Controller	Device	-
3	Workstation	I/O bus	Adapter	Port	Device	Session
4	Auxiliary Processor	I/O bus	Auxiliary Processor	Adapter	Port	-
5	Library	I/O adapter	I/O bus	Library	Controller	Device
6	Cryptography	I/O bus	Adapter	Device	-	-

The *Logical address* field contains the bus address and the unit address. The bus address describes the hardware bus, board, and card information. The unit address describes the subsystem and identifying data (see Table 48).

Note: To locate a device or card that is within the system unit, use the physical address information.

LIC-Detected Problem Reference Code Formats

Reference code formats.

Formats 60–63 in Table 46 on page 659 represent the formats for Licensed Internal Code (LIC) SRCs.

- Format 60 is used for LIC Attention SRCs.
- Format 61 is used when LIC detects a LIC programming problem.
- Format 62 is used when LIC detects an IOP Bus or IOP programming problem.

RRRR LIC *unit reference code* (URC).

cccc LIC *Component Reference Code* (CRC). Identifies the LIC component and subcomponent that generated the SRC.

pppp LIC *Program Reference Code* (PRC). Identifies the LIC class or component that generated the SRC and the specific error detected.

qqqq LIC *Program Reference Code Qualifier*. SRC words found at functions 15-3 through 19-3 or 15-3 and 16-3, depending on the format, provide additional error isolation information that is specific to the Program Reference Code. One or more of these words may be '0000 0000'. *Format 61* has up to 5 words of PRC Qualifier, in words 5-9. The PRC determines the *number* of PRC qualifier words. The *content* of words 5-9 is dependent on the value in word 4. *Format 62* has the PRC qualifier ONLY in words 5-6; there is physical address and type information in words 7-9.

BBBB Ccbb

Bus/Card/Board identifiers of failing component (direct select address)

@@@@

Unit address

ssss Serial number of failing unit

TTTT Type number or card identification number of failing component (hex 2xxx through 9FFF). May be 0000, if system data is not available at the time the SRC is signaled.

ZZZZ Reserved

mmmm

Model number of failing component (hex 2xxx through 9FFF). May be 0000, if system data is not available at the time the SRC is signaled.

CCCC Cause code

NNNN Number of disk device facilities missing

MIGV EP

General system status (see “System Reference Code (SRC) Information” on page 654 for more information.)

x Any hexadecimal number

Notes:

1. For information about Function 11 and 12, refer to “System Reference Code (SRC) Information” on page 654.
2. Format 60 may contain data in a format other than that shown. Format 60 is an old VLIC format, which some new LIC components use. It does not have the component reference code and program reference code that format 61 and 62 have (61 and 62 were specifically defined for the new LIC). Format 60 is mostly component-specific with no key information to indicate format (the developer has to interpret it). Refer to “Licensed internal code (LIC) isolation procedures” on page 103 and perform the problem isolation procedure used by the reference code to further define any significant data.

Using the Service Action Log

Use this procedure to search for an entry in the Service Action Log (SAL) that matches the time, reference code, or resource of the reported problem.

1. On the command line, enter the Start System Service Tools command (STRSST). If you cannot get to SST, use function 21 to get to DST.
2. On the Start Service Tools Sign On display, type in a user ID with QSRV authority and password.
3. Select **Start a Service Tool** → **Hardware Service Manager** → **Work with service action log**.
4. On the Select Timeframe display, change the From: Date and Time to a date and time prior to when the customer reported having the problem.
5. Search for an entry that matches one or more conditions of the problem:
 - Reference code
 - Resource
 - Time
 - Failing item list
6. Perform the following:
 - Choose **Display the failing item information** to display the SAL entry.
 - Use the **Display details** option to display part location information.

All new entries in the SAL represent problems that require a service action. It may be necessary to handle any problem in the log even if it does not match the original problem symptom.

The information displayed in the date and time fields are the date and time for the first occurrence of the specific reference code for the resource displayed during the time range selected.

7. Did you find an entry in the SAL?
 - **Yes:** Continue with the next step.
 - **No:** Go to "Problems with noncritical resources" on page 664. **This ends the procedure.**
8. Does "See the service information system reference code tables for further problem isolation" appear near the top of the display or are there procedures in the FRU list?
 - **Yes:** Perform the following steps:
 - a. Go to the list of reference codes and use the reference code that is indicated in the log to find the correct reference code table and unit reference code.
 - b. Perform all actions in the **Description/Action** column before exchanging failing items.

Note: When exchanging failing items, the part numbers and locations found in the SAL entry should be used.

This ends the procedure.

- **No:** Display the failing item information for the SAL entry. Items at the top of the failing item list are more likely to fix the problem than items at the bottom of the list. Continue with the next step.

Notes:

- a. Some failing items are required to be exchanged in groups until the problem is solved.
 - b. Other failing items are flagged as mandatory exchange and must be exchanged before the service action is complete, even if the problem appears to have been repaired.
 - c. Use the "Part Action Code" field in the SAL display to determine if failing items are to be replaced in groups or as mandatory exchanges.
 - d. Unless the "Part Action Code" of a FRU indicates group or mandatory exchange, exchange the failing items one at a time until the problem is repaired. Use the help function to determine the meaning of Part Action Codes.
9. Perform the following steps to help resolve the problem:

- a. To display location information, choose the function key for **Additional details**. If location information is available, go to Chapter 3, "Locating FRUs," on page 347 for the model you are working on to determine what removal and replacement procedure to perform. To turn on the failing item's identify light, use the "*indicator on*" option.

Note: In some cases where the failing item does not contain a physical identify light, a higher level identify light will be activated (for example, the planar or unit containing the failing item). The location information should then be used to locate the actual failing item.

- b. If the failing item is Licensed Internal Code, contact your next level of support for the correct PTF to apply.
10. After exchanging an item, perform the following:
 - a. Go to Chapter 5, "Verifying a repair," on page 611 and return here.
 - b. If the failing item indicator was turned on during the removal and replacement procedure, use the "*indicator off*" option to turn off the indicator.
 - c. If all problems have been resolved for the partition, use the "*Acknowledge all errors*" function at the bottom of the SAL display.
 - d. Close the log entry by selecting **Close a NEW entry** on the SAL Report display. **This ends the procedure.**

"Problems with noncritical resources"

Use this procedure to help you determine the cause of problems with noncritical resources.

Problems with noncritical resources

Use this procedure to help you determine the cause of problems with noncritical resources.

1. Is there an SRC in an 8-character format available on the Problem Summary form?

Note: If the operator has not filled out the problem summary form, go to the problem reporting procedure for the operating system in use.

No: Continue with the next step.

Yes: Perform problem analysis using the SRC. **This ends the procedure.**

2. Does the problem involve a workstation resource?

- **No:** Continue with the next step.
- **Yes:** Perform the following steps:
 - Check that the workstation is operational.
 - Verify that the cabling and addressing for the workstation is correct.
 - Perform any actions indicated in the system operator message.

If you need further assistance, contact your next level of support. **This ends the procedure.**

3. Does the problem involve a removable media resource?

No: Continue with the next step.

Yes: Go to "Using the product activity log" on page 76 to resolve the problem. **This ends the procedure.**

4. Does the problem involve a communications resource?

- **No:** Contact your next level of support. **This ends the procedure.**
- **Yes:** Are there any system operator messages that indicate a communications-related problem has occurred?
 - **No:** Contact your next level of support. **This ends the procedure.**
 - **Yes:** Perform any actions indicated in the system operator message. If you need further assistance, contact your next level of support. **This ends the procedure.**

System Service Tools (SST)

The system service tools (SST) run one or more Licensed Internal Code (LIC) or hardware service functions under the control of the operating system. SST allows you to perform service functions concurrently with the customer's application programs. The printer that is used for output must be an SCS-type data stream printer that is attached to the same workstation input-output processor (IOP) or storage media unit.

“Work with communications trace”

The *Work with communications trace* option is available only under System Service Tools (SST). Select this option from the Start a Service Tool display.

Work with communications trace

The *Work with communications trace* option is available only under System Service Tools (SST). Select this option from the Start a Service Tool display.

This option allows you to start or stop a communications line trace on a configuration object.

Once you run the trace, the data can be formatted. You can view the formatted data by printing it.

You should use communications trace for the following situations:

- To isolate errors that you cannot isolate using the communications verification procedure
- To collect more data when the problem analysis procedures do not provide enough information on the problem
- If you suspect a communications protocol violation problem or some other line problem
- If you suspect line noise
- When the error messages indicate that there is an SNA BIND problem

Running and interpreting the communications trace requires detailed knowledge of communications protocols. To obtain the most accurate sample of your line status, whenever possible, start the communications trace before varying on the lines .

Note: Online help from the Work with Communications Trace display allows you to view a list of protocols.

Options and Function Keys

The Work with Communications Traces display has the following options and function keys:

- Start trace (F6)

This function key allows you to start tracing the data on a communications configuration object. The *Start Trace* display appears after you press this function key. For more information, see “Starting a communications trace” on page 667.

- Stop trace (option 2)

This option appears only on the Work with Communications Traces display. It allows you to end the trace and stop collecting data. A trace must be stopped before you can format, print, or delete the data. To ensure that the trace is stopped, press the Refresh function key and check the trace status field.

- Delete trace (option 4)

The trace must be stopped (option 2) before you can use this option. Select this option to delete the trace information when you no longer need the data. Traces are not automatically deleted when you leave a communications trace function. *Delete trace* releases system space so that you can start other traces without having to increase the maximum amount of storage provided for the communications trace. Traces that are not deleted are listed on the Work with Communications Traces display.

- Format and print trace (option 6)

Use this option to format and print the trace. For more information on the *Format and print trace* option, see page “Format and print trace” on page 668.

- Display message (option 7)

Use this option to view a message that indicates the status of the trace that stopped because of an error.

- Restart trace (option 8)

Use this option to start a trace that has been stopped.

- Change size (F10)

Use this function key to change the amount of storage that all traces use. You might want to increase the amount of storage, if your system has many active traces or traces that will be active for a long time.

- Display buffer size or display trace status (F11)

This function key allows you to select and alternate between buffer size and trace status.

- Refresh (F5)

This function key updates the data on the display.

Status conditions

After the *Work with communications trace* option is selected from the Start a Service Tool display, the Work with Communications Traces display appears.

Work with Communications Traces

Type choice, press Enter.

2=Stop trace 4=Delete trace 6=Format and print trace
 7=Display message 8=Restart trace

Configuration

Opt	Object	Type	Trace Description	Protocol	Trace Status
—	LosAngeles	Line	Test LosAngeles Line	SDLC	Active
—	Mpls	NWI	Test Mpls	ISDN	Stopped
—	Tucson	Line	Test Tucson Line	ASYN	Waiting

F3=Exit F5=Refresh F6=Start trace F10=Change size
 F11=Display buffer size F12=Cancel

Figure 58. Example Work with Communications Trace display

Details of the trace, including status, are displayed. The trace status can be one of the following:

Condition Description

Waiting

The trace is waiting for the configuration object to be varied on (not collecting data).

Active The trace data is being collected.

Stopping

The trace is stopping.

Stopped

The trace has stopped (not collecting data).

Error An error occurred on the configuration object while the trace was collecting data. The data might or might not be collected. The trace stopped.

Starting

The trace is being started by another user. You cannot stop or delete this trace.

Formatting

Trace is being formatted.

Starting a communications trace

The following is an example of a *Start Trace* display:

```

                                Start Trace
Configuration object . . . . . _____
Type . . . . . 1 1=Line 2=Network interface
3=Network server
Trace description . . . . . _____
Buffer size (in kilobytes) . . . . . 1 1=128, 2=256, 3=2M, 4=4M,
5=6M, 6=8M, 7=16M, 8=32M, 9=64M
Stop on buffer full . . . . . N Y=Yes, N=No
Data direction . . . . . 3 1=Sent, 2=Received, 3=Both
Number of bytes to trace
Beginning bytes . . . . . *CALC VALUE, *CALC
Ending bytes . . . . . *CALC VALUE, *CALC
Type choices, press Enter.
F3=Exit F5=Refresh F12=Cancel
```

Enter the name of a communications configuration object description in the *Configuration object* prompt.

Describe the trace in the *Trace description* field. This field can help you identify the trace.

You can select a buffer size to hold the communications data that the trace collects. The default buffer size is 1=128K bytes. Base the size of the buffer on the speed of the communications line and on the amount of time necessary to trace the data. For high speed lines or long periods of tracing, a larger buffer size is recommended.

If you specify Yes in the field, the trace stops when the buffer is full. This option is useful for viewing the initial data that is coming across a line. If you specify No, the trace continues until you stop it. In this case, the data in the buffer will be written over each time the buffer is full.

You can select the direction of data to be traced by specifying one of the three selections in the *Data direction* field:

- Only data that the system is sending (option 1)
- Only data that the system is receiving (option 2)
- Both the data sent and received by the system (option 3)

Note: If you specify option 1 (*Sent*) for lines that are in SDLC short hold mode, the trace does not include controller names.

You can select how much data is traced in a frame of data. The value that is entered is the amount that is saved as part of the trace. The minimum value that is allowed for both the beginning and the end value is

36 bytes. Those 36-byte minimum values include the protocol header. The configuration object you are tracing determines the maximum value that is allowed.

Notes:

1. The BSC protocol ignores the beginning and ending byte values.
2. The SDLC, high-level data link control (HDLC), X.25, frame relay, Ethernet, distributed data interface (DDI), ATM, and token-ring protocols ignore the ending byte value.
3. The minimum value that is allowed for the beginning byte value for local area network (LAN) protocols (including frame relay protocols and ATM protocols) is 72 bytes.

When all required options are complete, press the Enter key. The Work with Communications Trace display appears.

If the communications object being traced is in varied off status when you start the trace, the trace remains in waiting status until you vary the communications object on. If the object is varied on, the trace will immediately go to the active state, and the system will begin to collect trace data.

The trace remains active until one of the following occurs:

- You select the option to stop the trace on the Work with Communications Traces display.
- You vary off the configuration object being traced.
- The configuration object being traced has an error.
- The trace buffer is full, and the option to stop on buffer full was selected.

Note: You can exit the communications trace function to do other work while the trace is active.

Traces are not automatically deleted when you exit a communications trace function. To return to the communications trace:

1. Select the **Start a service tool** option from the service tools (SST or DST) display.
2. Select the **Work with communications traces** option.
3. From the Work with Communications Traces display, you can check the status of the trace or select to stop the trace.

Format and print trace

You must select the *Stop Trace* option before you format or print the trace. The *Format and print trace* option allows you to select various formatting options and prepare the trace data for printing. The options vary for each protocol. The following is an example of the Format Trace Data display:

```

                                Format Trace Data
Configuration object . . . . . TRNLINE
Type . . . . . LINE
Type choices, press Enter.
Controller . . . . . *ALL      *ALL, name
Data representation . . . . . 3      1=ASCII, 2=EBCDIC, 3=*CALC
Format RR, RNR commands . . . N      Y=Yes, N=No
Format Broadcast data . . . . Y      Y=Yes, N=No
Format MAC or SMT data only. . N      Y=Yes, N=No
Format UI data only . . . . . N      Y=Yes, N=No
Format TCP/IP data only . . . N      Y=Yes, N=No

F3=Exit   F5=Refresh   F12=Cancel

```

Figure 59. Example Format Trace Data Display

Notes:

1. To view all the data associated with the trace, press the Enter key without changing to the defaults on the Format a Trace Data display . The information is not in any special format.
2. Select the option to format and print only the data that you want to see.
3. All options available for formatting depend on the protocol of the line that is being traced. Only valid choices appear for each protocol.
4. Not all combinations of options are valid for all protocols. Error messages appear, if you select an option that is not valid, . If an error message appears, you must change your selections. Use the F5 (Refresh) function key to restore all options to their default values.
5. For more information about these options, use online help .

When the format of the trace data is complete, the output can be printed on the console printer (the printer that is attached to the same I/O processor as the console). Only SCS-type data streams are supported.

The format of the trace data is:

- An introduction page that contains, for example, configuration object, type, protocol, start and stop dates and times, trace options, and formatting options.
- A help page, to assist in understanding the output. Help information for a specific protocol is given because the trace data differs for each communications protocol.
- The formatted appears as follows:

Record Number	S/R	Data Length	Record Status	Record Timer	Data Type	Controller Name/Number	Command	Number Sent	Number Received	Poll/Final
7	R	69	00000000	12:29:56.72963	EBCDIC	ZSDLLC30 /01	XID	00000007000E0DF4	00000007000E0DF4	ON
Data : 3245056150080000 0084C00000000000 0101080000010900 *.;...D{.....4*										
DADBCC4BDACBCDCE EFCGC5F31017F116 1101130011F9F4F0 F6F5F0F0F1F0F1F0 *ABC.ABCDEFG..1.....94065001010*										
C4C6C44040 *DFD *										
8	S	0	00000000	12:29:56.76081	EBCDIC	ABCLLC30 /01	SNRM			ON
9	R	0	00000000	12:29:56.78450	EBCDIC	ABCLLC30 /01	UA			ON
52	S	110	00000000	12:29:57.76210	EBCDIC	ABCLLC30 /01	I	0	0	ON
Data : 2D00010200006B81 0031001307B0B051 3107878686870706 0200000000000000 *.....A.....GFFG.....*										
944300000CDADBCC 4BEAEBCCD3D3C4F3 F02E000902E2D5C1 E2E5C3D4C7090300 *M....ABC.ABCLLD30....SNASVCMG...*										
00BCF9CAD6000000 04DADBCC4BEAEBCC D3D3C4F3F00A1300 7B00BCF9CAD60000 *..9.0....ABC.ABCLLD30...#.9.0..*										
000CDADBCC4BEAEB CDD3D3C4F4F0 *..ABC.ABCLLD40 *										
53	R	110	00000000	12:29:57.80065	EBCDIC	ABCLLC30 /01	I	0	1	ON
Data : 2F00010200006B81 0031001307B0B051 3107878686870706 0200000000000000 *.....A.....GFFG.....*										
944300000CDADBCC 4BEAEBCCD3D3C4F4 F02E000902E2D5C1 E2E5C3D4C7090300 *M....ABC.ABCLLD40....SNASVCMG...*										
00BCF9D566000000 04DADBCC4BEAEBCC D3D3C4F4F00A1300 7B00BCF9D5660000 *..9N....ABC.ABCLLD40...#.9N...*										
000CDADBCC4BEAEB CDD3D3C4F4F0 *..ABC.ABCLLD30 *										
***** END OF EXAMPLE PRINTOUT *****										

Figure 60. Example Formatted Trace Data Output for SDLC

The width of the file is 132 characters. The data is in hexadecimal representation and either American National Standard Code for Information Interchange (ASCII) or EBCDIC character representation. The columns of the trace output common to all protocols are:

Record number

The number of the trace record. Shows if the record type is sent (S) or received (R).

Notes:

1. The letter C in this column indicates that an X.21 short hold mode connection was cleared.
2. If an M appears, a modem change has occurred.

Data length

The amount of data, in decimal, that the record contains.

Record status

The protocol-dependent return code for the trace record. 00000000 is successful; no errors were found. Other return codes are listed in the functional specification for the protocol that is running or the port manager.

Record timer

The time that each event occurs. Depending on the communications hardware that is being used, the record timer will be either:

1. A time of day value, HH:MM:SS.NNNNN (where H=hours, M=minutes, S=seconds, and N=subseconds), based on the system time when the trace was stopped.
2. A relative time in decimal seconds. This timer value provides the relative time between events.

Data type

Shows whether the traced data is printed in ASCII or EBCDIC character representation. If the character representation of the data is mostly periods, you might want to format the data again using the other option for data representation.

Controller name/number

Indicates which controller originated the frame or record. In some conditions, this data is not available, and the column remains blank.

Note: The formatted trace output is not security protected. Customer passwords are shown going across the line.

More information from hexadecimal reports

You can get additional information for IOP 90xx reference code product activity log entries at DST by using a D-IPL.

Note: The term I/O processor may indicate an IOP or an IOA.

Below are examples of how to interpret hexadecimal information for a D-IPL.

Note: Formatting is available (F4=Additional Information) for IPL from disk (A- or B-IPL). Formatting is not available in DST from a D-IPL.

Use the information below and the example displays on the following pages to interpret the hexadecimal dump information that begins at offset hex 000180.

If the rightmost hex digit of the offset 000182 is 8, get the format from offset 00091F, then use the following table to determine what figure to use.

Table 49. Format number to figure usage

Format number	Reference the following figures
01	Figure 61 on page 672 Figure 62 on page 673 Figure 63 on page 673
02	Figure 64 on page 674 Figure 65 on page 675 Figure 66 on page 675
03	Figure 67 on page 676 Figure 68 on page 676 Figure 69 on page 676
04	Figure 70 on page 677 Figure 71 on page 678 Figure 72 on page 678

If the rightmost hex digit of offset 000182 is 2, get the format number from offset 0001B5, then use the following table to determine what table to use.

Table 50.

Format number	Reference the following tables
01	Table 51 on page 678
02	Table 52 on page 679
03	Table 53 on page 680
04	Table 54 on page 681
11	Table 55 on page 681
12	Table 56 on page 682
13	Table 57 on page 682

Table 50. (continued)

Format number	Reference the following tables
14	Table 58 on page 683
17	Table 59 on page 685
20	Table 60 on page 686

Device formatting log example (unformatted information)

Display Hexadecimal Report for Resource									
Name	Type	Model	Serial				Resource		
STORAGE	6607	070	Number				Name		
			00-68753						
Offset	0 1 2 3	4 5 6 7	8 9 A B	C D E F	EBCDIC				
000180	F8407800	65320001	90920210	010400FF	8	.....k.....			
000190	66070000	00001306	87531400	123D0001		.....g.....			
0001A0	00000000	00000000	CA000003	00000000		.....		
0001B0	65320001	07050011	00000000	00000000		.....		
0001C0	00000004	00000003	00000000	00000000		.....		
0001D0	F6F6F0F7	13068753	010400FF	00000000	6607	..g			
0001E0	00000000	65320001	07050011	47000001		.....		
0001F0	07069205	C0004000	00000021	00000030	..k.{	.....		
000200	00000000	00000000	F6F6F0F7	00071575	.....6607	....		
000210	010300FF	00000000	00000000	65320001		.....		
000220	07050011	47000001	07069205	C0004000	.....k.{	..			
000230	00000000	00000000	00000000	00000000		.....		
000240	F6F6F0F7	00259DE8	010200FF	00000000	6607...Y			
000250	00000000	65320001	07050011	47000001		.....		
000260	07069205	C0404040	00000000	00000000	..k.{	.....		
000270	00000000	00000000	E2E5C3C4	D6C3E2C3SVCDOCSC				
000280	D7D7F2F9	C1F800D5	00000000	00000000	PP29A8	..N			
000290	00000000	00000000	00000000	00000000		.....		
0002A0	00000000	00000000	00000000	00000000		.....		
0002B0	00000000	00000000	00000000	00000000		.....		
0002C0	00000000	00000000	00000000	00000000		.....		
0002D0	00000000	00000000	C3D7D7F8	F9F2F9D5	.....CPP8929N				
0002E0	F6F5F3F2	F9F0F9F2	F0F0F0F0	F0F0F0F0	65329092	00000000			
0002F0	F0F0F0F0	F0F1F6C3	F0F1F3F3	0000D5D5	0000016C	0133..NN			
000300	00000000	00000000	00000000	00000000	.....			

Figure 61. Example Hexadecimal Report, Device Formatting Log (unformatted information)

Device formatting log template

Display Hexadecimal Report for Resource												
Name	Type	Model	Serial				Resource					
STORAGE	6607	070	00-68753				Name					
Offset	0 1 2 3	4 5 6 7	8 9 A B	C D E F								
000180	-----	-----	-----	-----								
000190	-----	-----	-----	-----	-01							
0001A0	-----	-----	-----	-----								
0001B0	-----	-----	-----	-----								
0001C0	# errors detected	# errors logged	-----	-----								
0001D0	Device1 Type	Device1 Serial	Device1 UnitAddr	New Dev1 Type								
0001E0	New Dev1 Serial	IOP type & model	IOP Serial	Cache Type/Mod								
0001F0	Cache Serial	-----	-----	-----								
000200	-----	-----	Device2 Type	Device2 Serial								
000210	Device2 UnitAddr	New Dev2 Type	New Dev2 Serial	IOP type & model								
000220	IOP Serial	Cache Type/Mod	Cache Serial	-----								
000230	-----	-----	-----	-----								
000240	Device3 Type	Device3 Serial	Device3 UnitAddr	New Dev3 Type								
000250	New Dev3 Serial	IOP type & model	IOP Serial	Cache Type/Mod								
000260	Cache Serial	-----	-----	-----								

Figure 62. Example Hexadecimal Report, Device Formatting Log Template

Device formatting log example (as formatted information for A or B IPL)

Display Additional Information for Resource				
Name	Type	Model	Serial Number	Resource Name
STORAGE	6607	070	00-68753	
Device Errors detected :			4	
Device Errors logged :			3	
Device :	1	2	3	
Unit Address :	010400FF	010300FF	010200FF	
Type :	6607	6607	6607	
Serial Number . . . :	13068753	00071575	00259DE8	
New Device Information:				
Type :	****	****	****	
Serial Number . . . :	00000000	00000000	00000000	
I/O Processor Information:				
Type :	6532	6532	6532	
Serial Number . . . :	07050011	07050011	07050011	
Cache Adaptor Card Information:				
Type :	4700	4700	4700	
Serial Number . . . :	07069205	07069205	07069205	

Figure 63. Example Hexadecimal Report, Device Formatting (As formatted information for A or B IPL)

Array member formatting log example (unformatted information)

Display Hexadecimal Report for Resource									
Name	Type	Model	Serial	Resource					
STORAGE	6532	001	00-50011	Name					
Offset	0 1 2 3	4 5 6 7	8 9 A B	C D E F	EBCDIC				
000180	F4407800	65320001	90210210	0FFFFFFF	4	.....		
000190	00000000	00000000	00001400	12400002	.....	..	
0001A0	00000000	00000000	CA000003	00000000	.....			
0001B0	65320001	07050011	00000000	00000000	.....			
0001C0	F6F6F0F7	0025ED09	000200FF	000200FF	6607	.....		
0001D0	F6F6F0F7	00158135	000100FF	000100FF	6607	..a.....			
0001E0	F6F6F0F7	00259DE8	010200FF	00000000	6607	...Y.....			
0001F0	F6F6F0F7	00008326	010100FF	00000000	6607	..c.....			
000200	F6F6F0F7	00071575	010300FF	00000000	6607	.....		
000210	F6F6F0F7	13068753	010400FF	00000000	6607	..g.....			
000220	00000000	00000000	00000000	00000000	.....			
000230	00000000	00000000	00000000	00000000	.....			
000240	00000000	00000000	00000000	00000000	.....			
000250	00000000	00000000	00000000	00000000	.....			
000260	000000FF	00000004	00000000	00000000	.....			
000270	00000000	E2E5C3C4	D6C3E2C3	D7D7F2F9	...	SVCDOCSCPP29			
000280	C1F800D5	00000000	00000000	00000000	A8.N			
000290	00000000	00000000	00000000	00000000	.....			
0002A0	00000000	00000000	00000000	00000000	.....			
0002B0	00000000	00000000	00000000	00000000	.....			
0002C0	00000000	00000000	00000000	00000000	.....			
0002D0	00000000	C3D7D7C5	C1F0F2D5	F6F5F3F2	...	CPPEA02N6532			
0002E0	F9F0F2F1	F0F0F0F0	F0F0F0F0	F0F0F0F0	9021000000000000				
0002F0	F0F0C4F4	F0F1F3F3	0000D5D5	00000000	00D40133	..NN....			
000300	00000000	00000000	00000000	00000000	.....			

Figure 64. Example Hexadecimal Report, Array Member Formatting Log (unformatted information)

Array member formatting log template

Display Hexadecimal Report for Resource												
Name	Type	Model	Serial Number				Resource Name					
STORAGE	6532	001	00-50011									
Offset	0 1 2 3	4 5 6 7	8 9 A B	C D E F								
000180	-----	-----	-----	-----								
000190	-----	-----	-----	-----02								
0001A0	-----	-----	-----	-----								
0001B0	-----	-----	-----	-----								
0001C0	Member0	Member0	Expected	Current								
	Type	Serial	Address	Address								
0001D0	Member1	Member1	Expected	Current								
	Type	Serial	Address	Address								
0001E0	Member2	Member2	Expected	Current								
	Type	Serial	Address	Address								
0001F0	Member3	Member3	Expected	Current								
	Type	Serial	Address	Address								
000200	Member4	Member4	Expected	Current								
	Type	Serial	Address	Address								
000210	Member5	Member5	Expected	Current								
	Type	Serial	Address	Address								
000220	Member6	Member6	Expected	Current								
	Type	Serial	Address	Address								
000230	Member7	Member7	Expected	Current								
	Type	Serial	Address	Address								
000240	Member8	Member8	Expected	Current								
	Type	Serial	Address	Address								
000250	Member9	Member9	Expected	Current								
	Type	Serial	Address	Address								

Figure 65. Example Hexadecimal Report, Array Member Formatting Log Template

Array member formatting log example (as formatted information for A or B IPL)

Display Additional Information for Resource							
Name	Type	Model	Serial Number	Resource Name			
STORAGE	6532	001	00-50011				
Array Member	. . . . .	:	0	1	2	3	4
Type	. . . . .	:	6607	6607	6607	6607	6607
Serial Number	. . . .	:	0025ED09	00158135	00259DE8	00008326	00071575
Unit Address:							
Current	. . . . .	:	000200FF	000100FF	00000000	00000000	00000000
Expected	. . . . .	:	000200FF	000100FF	010200FF	010100FF	010300FF
Array Member	. . . . .	:	5	6	7	8	9
Type	. . . . .	:	6607	****	****	****	****
Serial Number	. . . .	:	13068753	00000000	00000000	00000000	00000000
Unit Address:							
Current	. . . . .	:	00000000	00000000	00000000	00000000	00000000
Expected	. . . . .	:	010400FF	00000000	00000000	00000000	00000000

Figure 66. Example Hexadecimal Report, Array Member Formatting (As formatted information for A or B IPL)

Configuration formatting log example (unformatted information)

Display Hexadecimal Report for Resource						
Name	Type	Model	Serial Number	Resource Name		
STORAGE	6532	001	00-50011			
Offset	0 1 2 3	4 5 6 7	8 9 A B	C D E F	EBCDIC	
000180	50407800	65320001	90120210	0FFFFFFF	&	
000190	00000000	00000000	00001400	123C0003	.....
0001A0	00000000	00000000	CA000003	00000000	.....
0001B0	65320001	07050011	00000000	00000000	.....
0001C0	00000000	00000000	47000001	07069205	.....k.	
0001D0	F8F6C7F8	F1F4F9C3	D7D7F8F9	F8F100D5	86G8149CPP8981.N	
0001E0	00000000	00000000	00000000	00000000	.....
0001F0	00000000	00000000	00000000	00000000	.....
000200	00000000	00000000	00000000	00000000	.....
000210	00000000	00000000	00000000	00000000	.....
000220	00000000	00000000	00000000	00000000	.....
000230	C3D7D7C5	C1F0F2D5	F6F5F3F2	F9F0F1F2	CPPEA02N65329012	
000240	F0F0F0F0	F0F0F0F0	F0F0F0F0	F0F0C4F4	00000000000000D4	
000250	F0F1F3F4	0000E8D5	00000000	00000000	0134..YN.....	

Figure 67. Example Hexadecimal Report, Configuration Formatting log (unformatted information)

Configuration formatting log template

Display Hexadecimal Report for Resource						
Name	Type	Model	Serial Number	Resource Name		
STORAGE	6532	001	00-50011			
Offset	0 1 2 3	4 5 6 7	8 9 A B	C D E F		
000180	-----	-----	-----	-----		
000190	-----	-----	-----	-----03		
0001A0	-----	-----	-----	-----		
0001B0	Current	Current	Current	Current		
	IOP type	IOP	Cache	Cache		
	& model	serial	type	serial		
0001C0	Expected	Expected	Expected	Expected		
	IOP type	IOP	Cache	Cache		
	& model	serial	type	serial		

Figure 68. Example Hexadecimal Report, Configuration Formatting Log Template

Configuration formatting log example (as formatted information for A or B IPL)

Display Additional Information for Resource				
Name	Type	Model	Serial Number	Resource Name
STORAGE	6532	001	00-50011	
Configuration		Current		Expected
I/O Processor Information:				
Type			6532		0000
Serial Number . . . .		07050011		00000000
Cache Adaptor Card Information:				
Type			0000		4700
Serial Number . . . .		00000000		07069205

Figure 69. Example Hexadecimal Report, Configuration Formatting Log (As formatted information for A or B IPL)

Array addendum formatting log example (unformatted information)

Display Hexadecimal Report for Resource									
Name	Type	Model	Serial	Resource					
STORAGE	2757	001	10-0322005	DC03					
Offset	0 1 2 3	4 5 6 7	8 9 A B	C D E F	EBCDIC				
000000	C5D3F0F5	000000A0	00E00180	82745D0F	EL05.....b.).				
000010	1FD78000	00002CE0	20100084	049F0000	.P.....d....				
000020	902F0000	11000000	00000000	00C70000	.....G..				
000030	F2F7F5F7	F0F0F140	F1F060F0	F3F2F2F0	2757001 10-03220				
000040	F0F50000	0000F2F7	F5F70002	00020000	05....2757.....				
000050	00200000	0002FFFF	FFFFFFF	0004FFFF	.....			
000060	00000000	00000000	00000000	40404040	.....			
000070	40404040	40400000	00000000	00000000	.....			
000080	00000000	00000000	00000000	00000000	.....			
000090	00000000	00000000	00000000	00000000	.....			
0000A0	00000000	00000000	00000000	00000000	.....			
0000B0	00000000	00000000	40404040	40404040	.....			
0000C0	40404040	40404040	40404040	40404040					
0000D0	40404040	40404040	40404040	40404040					
0000E0	F2F7F5F7	F0F0F0F1	0000E2D3	C9C3C9D6	27570001..SLICIO				
0000F0	4040E5F5	D9F2D4F0	40400000	00000000	V5R2M0				
000100	00B90000	00000000	000000C7	00000000	.....G....				
000110	00000000	00000000	00000000	00000000	.....			
000120	00000000	00000000	00000000	00000000	.....			
000130	00000000	00000000	00000000	00000000	.....			
000140	C4C3F0F3	40404040	40404040	40404040	DC03				
000150	D5C5C5C4	E5C1D3C9	C4D740D5	00070001	NEEDVALIDP N....				
000160	00000000	A0200007	00000000	00000000	.....			
000170	00000000	00000000	0003001E	000000A0	.....			
000180	A0407800	27570001	902F0200	4FFFFFFF	. ...*.....|...			
000190	00000000	00000000	00001400	623E0004	.....			
0001A0	F6F6F0F7	0026121D	410500FF	410500FF	6607.....				
0001B0	F6F6F0F7	00248B85	410400FF	410400FF	6607...e.....				
0001C0	F6F6F0F7	0014BE1F	410300FF	410300FF	6607.....				
0001D0	F6F6F0F7	0014C0F0	410200FF	410200FF	6607..{0.....				
0001E0	F6F6F0F7	001403C8	410100FF	410100FF	6607...H.....				
0001F0	F6F6F0F7	0014BEA4	410800FF	410800FF	6607...u.....				
000200	00000000	00000000	00000000	00000000	.....			
000210	00000000	00000000	00000000	00000000	.....			

Figure 70. Example Hexadecimal Report, Array Addendum Formatting Log (unformatted information)

Array addendum log template

Display Hexadecimal Report for Resource									
Name	Type	Model	Serial Number	Resource Name					
STORAGE	6532	001	00-50011						
Offset	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
000180	-----								
000190	-----			-----			-----			-----			04			
0001A0	Member10	Member10	Expected	Current					
	Type	Serial	Address	Address					
0001B0	Member11	Member11	Expected	Current					
	Type	Serial	Address	Address					
0001C0	Member12	member12	Expected	Current					
	Type	Serial	Address	Address					
0001D0	Member13	Member13	Expected	Current					
	Type	Serial	Address	Address					
0001E0	Member14	Member14	Expected	Current					
	Type	Serial	Address	Address					
0001F0	Member15	Member15	Expected	Current					
	Type	Serial	Address	Address					
000200	Member16	Member16	Expected	Current					
	Type	Serial	Address	Address					
000210	Member17	Member17	Expected	Current					
	Type	Serial	Address	Address					

Figure 71. Example Hexadecimal Report, Array Addendum Formatting Log Template

Array addendum log example (as formatted information for A or B IPL)

Display Additional Information for Resource							
Name	Type	Model	Serial Number	Resource Name			
STORAGE	2757	001	10-0322005	DC03			
Array Member	:	10	11	12	13	14
Type	:	6607	6607	6607	6607	6607
Serial Number	:	0026121D	00248B85	0014BE1F	0014C0F0	001403C8
Unit Address:							
Current	:	410500FF	410400FF	410300FF	410200FF	410100FF
Expected	:	410500FF	410400FF	410300FF	410200FF	410100FF
Array Member	:	15	16	17		
Type	:	6607	****	****		
Serial Number	:	0014BEA4	00000000	00000000		
Unit Address:							
Current	:	410800FF	00000000	00000000		
Expected	:	410800FF	00000000	00000000		

Figure 72. Example Hexadecimal Report, Array Addendum Formatting (as formatted information for A or B IPL)

Table 51. Format 01

Description	Hex offset
Device errors detected	0001D6 - 0001D9
Device errors logged	0001DA - 0001DD
Device 1 type	0001E6 - 0001E9
Device 1 serial number	0001EA - 0001ED
Device 1 unit address	0001EE - 0001F1
New device 1 type	0001F2 - 0001F5

Table 51. Format 01 (continued)

Description	Hex offset
New device 1 serial number	0001F6 - 0001F9
Device 1 IOA type and model	0001FA - 0001FD
Device 1 IOA serial number	0001FE - 000201
Device 1 Cache type and model	000202 - 000205
Device 1 Cache serial number	000206 - 000209
Device 2 type	00021E - 000221
Device 2 serial number	000222 - 000225
Device 2 unit address	000226 - 000229
New device 2 type	00022A - 00022D
New device 2 serial number	00022E - 000231
Device 2 IOA type and model	000232 - 000235
Device 2 IOA serial number	000236 - 000239
Device 2 cache type and model	00023A - 00023D
Device 2 cache serial number	00023E - 000241
Device 3 type	000256 - 000259
Device 3 serial number	00025A - 00025D
Device 3 unit address	00025E - 000261
New device 3 type	000262 - 000265
New device 3 serial number	000266 - 000269
Device 3 IOA type and model	00026A - 00026D
Device 2 IOA serial number	00026E - 000271
Device 3 cache type and model	000272 - 000275
Device 3 cache serial number	000276 - 000279

Table 52. Format 02

Description	Hex offset
Array member 0 type	0001D6 - 0001D9
Array member 0 serial number	0001DA - 0001DD
Array member 0 expected unit address	0001DE - 0001E1
Array member 0 current unit address	0001E2 - 0001E5
Array member 1 type	0001E6 - 0001E9
Array member 1 serial number	0001EA - 0001ED
Array member 1 expected unit address	0001EE - 0001F1
Array member 1 current unit address	0001F2 - 0001F5
Array member 2 type	0001F6 - 0001F9
Array member 2 serial number	0001FA - 0001FD
Array member 2 expected unit address	0001FE - 000201
Array member 2 current unit address	000202 - 000205
Array member 3 type	000206 - 000209
Array member 3 serial number	00020A - 00020D

Table 52. Format 02 (continued)

Description	Hex offset
Array member 3 expected unit address	00020E - 000211
Array member 3 current unit address	000212 - 000215
Array member 4 type	000216 - 000219
Array member 4 serial number	00021A - 00021D
Array member 4 expected unit address	00021E - 000221
Array member 4 current unit address	000222 - 000225
Array member 5 type	000226 - 000229
Array member 5 serial number	00022A - 00022D
Array member 5 expected unit address	00022E - 000231
Array member 5 current unit address	000232 - 000235
Array member 6 type	000236 - 000239
Array member 6 serial number	00023A - 00023D
Array member 6 expected unit address	00023E - 000241
Array member 6 current unit address	000242 - 000245
Array member 7 type	000246 - 000249
Array member 7 serial number	00024A - 00024D
Array member 7 expected unit address	00024E - 000251
Array member 7 current unit address	000252 - 000255
Array member 8 type	000256 - 000259
Array member 8 serial number	00025A - 00025D
Array member 8 expected unit address	00025E - 000261
Array member 8 current unit address	000262 - 000265
Array member 9 type	000266 - 000269
Array member 9 serial number	00026A - 00026D
Array member 9 expected unit address	00026E - 000271
Array member 9 current unit address	000272 - 000275

Table 53. Format 03

Description	Hex offset
Current I/O card type	0001C6 - 0001C7
Current I/O card serial number	0001CA - 0001CD
Current cache type	0001CE - 0001CF
Current cache serial number	0001D2 - 0001D5
Expected I/O card type	0001D6 - 0001D7
Expected I/O card serial number	0001DA - 0001DD
Expected cache type	0001DE - 0001DF
Expected cache serial number	0001E2 - 0001E5

Table 54. Format 04

Description	Hex offset
Array member 10 type	0001B6 - 0001B9
Array member 10 serial number	0001BA - 0001BD
Array member 10 expected unit address	0001BE - 0001C1
Array member 10 current unit address	0001C2 - 0001C5
Array member 11 type	0001C6 - 0001C9
Array member 11 serial number	0001CA - 0001CD
Array member 11 expected unit address	0001CE - 0001D1
Array member 11 current unit address	0001D2 - 0001D5
Array member 12 type	0001D6 - 0001D9
Array member 12 serial number	0001DA - 0001DD
Array member 12 expected unit address	0001DE - 0001E1
Array member 12 current unit address	0001E2 - 0001E5
Array member 13 type	0001E6 - 0001E9
Array member 13 serial number	0001EA - 0001ED
Array member 13 expected unit address	0001EE - 0001F1
Array member 13 current unit address	0001F2 - 0001F5
Array member 14 type	0001F6 - 0001F9
Array member 14 serial number	0001FA - 0001FD
Array member 14 expected unit address	0001FE - 000201
Array member 14 current unit address	000202 - 000205
Array member 15 type	000206 - 000209
Array member 15 serial number	00020A - 00020D
Array member 15 expected unit address	00020E - 000211
Array member 15 current unit address	000212 - 000215
Array member 16 type	000216 - 000219
Array member 16 serial number	00021A - 00021D
Array member 16 expected unit address	00021E - 000221
Array member 16 current unit address	000222 - 000225
Array member 17 type	000226 - 000229
Array member 17 serial number	00022A - 00022D
Array member 17 expected unit address	00022E - 000231
Array member 17 current unit address	000232 - 000235

Table 55. Format 11

Description	Hex offset
SCSI sense data	0001C4 - 0001E3
Worldwide ID of device with problem	0001E4 - 001EB
Unit address of device with problem	0001EC - 0001EF
SCSI command descriptor block	0001F4 - 000203
Problem description	000204 - 000223

Table 56. Format 12

Description	Hex offset
Current I/O card type and model	0001C4 - 0001CB
Current I/O card serial number	0001CC - 0001D3
Current I/O card worldwide ID	0001D4 - 0001DB
Current cache type and model	0001DC - 0001E3
Current cache serial number	0001E4 - 0001EB
Current cache worldwide ID	0001EC - 0001F3
Previous I/O card type and model	0001FC - 000203
Previous I/O card serial number	000204 - 00020B
Previous I/O card worldwide ID	00020C - 000213
Previous cache type and model	000214 - 00021B
Previous cache serial number	00021C - 000223
Previous cache worldwide ID	000224 - 00022B

Table 57. Format 13

Description	Hex offset
Device errors detected	0001FC - 0001FF
Device errors logged	000200 - 000203
Device 1 type	000204 - 000207
Device 1 serial number	000208 - 00020F
Device 1 worldwide ID	000210 - 000217
Device 1 unit address	000218 - 00021B
New device 1 type	00021C - 00021F
New device 1 serial number	000220 - 000227
New device 1 worldwide ID	000228 - 00022F
Device 1 IOA type and model	000230 - 000237
Device 1 IOA serial number	000238 - 00023F
Device 1 IOA worldwide ID	000240 - 000247
Device 1 cache type and model	000248 - 00024F
Device 1 cache serial number	000250 - 000257
Device 1 cache worldwide ID	000258 - 00025F
Device 2 type	000260 - 000263
Device 2 serial number	000264 - 00026B
Device 2 worldwide ID	00026C - 000273
Device 2 unit address	000274 - 000277
New device 2 type	000278 - 00027B
New device 2 serial number	00027C - 000283
New device 2 worldwide ID	000284 - 00028B
Device 2 IOA type and model	00028C - 000293
Device 2 IOA serial number	000294 - 00029B
Device 2 IOA worldwide ID	00029C - 0002A3

Table 57. Format 13 (continued)

Description	Hex offset
Device 2 cache type and model	0002A4 - 0002AB
Device 2 cache serial number	0002AC - 0002B3
Device 2 cache worldwide ID	0002B4 - 0002BB
Device 3 type	0002BC - 0002BF
Device 3 serial number	0002C0 - 0002C7
Device 3 worldwide ID	0002C8 - 0002CF
Device 3 unit address	0002D0 - 0002D3
New device 3 type	0002D4 - 0002D7
New device 3 serial number	0002D8 - 0002DF
New device 3 worldwide ID	0002E0 - 0002E7
Device 3 IOA type and model	0002E8 - 0002EF
Device 3 IOA serial number	0002F0 - 0002F7
Device 3 IOA worldwide ID	0002F8 - 0002FF
Device 3 cache type and model	000300 - 000307
Device 3 cache serial number	000308 - 00030F
Device 3 cache worldwide ID	000310 - 000317

Table 58. Format 14

Description	Hex offset
RAID number	000204 - 00020B
Array member 0 type	00020C - 00020F
Array member 0 serial number	000210 - 000217
Array member 0 worldwide ID	000218 - 00021F
Array member 0 expected unit address	000220 - 000223
Array member 0 current unit address	000224 - 000227
Array member 1 type	000228 - 00022B
Array member 1 serial number	00022C - 000233
Array member 1 worldwide ID	000234 - 00023B
Array member 1 expected unit address	00023C - 00023F
Array member 1 current unit address	000240 - 000243
Array member 2 type	000244 - 000247
Array member 2 serial number	000248 - 00024F
Array member 2 worldwide ID	000250 - 000257
Array member 2 expected unit address	000258 - 00025B
Array member 2 current unit address	00025C - 00025F
Array member 3 type	000260 - 000263
Array member 3 serial number	000264 - 00026B
Array member 3 worldwide ID	00026C - 000273
Array member 3 expected unit address	000274 - 000277
Array member 3 current unit address	000278 - 00027B

Table 58. Format 14 (continued)

Description	Hex offset
Array member 4 type	00027C - 00027F
Array member 4 serial number	000280 - 000287
Array member 4 worldwide ID	000288 - 00028F
Array member 4 expected unit address	000290 - 000293
Array member 4 current unit address	000294 - 000297
Array member 5 type	000298 - 00029B
Array member 5 serial number	00029C - 0002A3
Array member 5 worldwide ID	0002A4 - 0002AB
Array member 5 expected unit address	0002AC - 0002AF
Array member 5 current unit address	0002B0 - 0002B3
Array member 6 type	0002B4 - 0002B7
Array member 6 serial number	0002B8 - 0002BF
Array member 6 worldwide ID	0002C0 - 0002C7
Array member 6 expected unit address	0002C8 - 0002CB
Array member 6 current unit address	0002CC - 0002CF
Array member 7 type	0002D0 - 0002D3
Array member 7 serial number	0002D4 - 0002DB
Array member 7 worldwide ID	0002DC - 0002E3
Array member 7 expected unit address	0002E4 - 0002E7
Array member 7 current unit address	0002E8 - 0002EB
Array member 8 type	0002EC - 0002EF
Array member 8 serial number	0002F0 - 0002F7
Array member 8 worldwide ID	0002F8 - 0002FF
Array member 8 expected unit address	000300 - 000303
Array member 8 current unit address	000304 - 000307
Array member 9 type	000308 - 00030B
Array member 9 serial number	00030C - 000313
Array member 9 worldwide ID	000314 - 00031B
Array member 9 expected unit address	00031C - 00031F
Array member 9 current unit address	000320 - 000323
Array member 10 type	000324 - 000327
Array member 10 serial number	000328 - 00032F
Array member 10 worldwide ID	000330 - 000337
Array member 10 expected unit address	000338 - 00033B
Array member 10 current unit address	00033C - 00033F
Array member 11 type	000340 - 000343
Array member 11 serial number	000344 - 00034B
Array member 11 worldwide ID	00034C - 000353
Array member 11 expected unit address	000354 - 000357
Array member 11 current unit address	000358 - 00035B

Table 58. Format 14 (continued)

Description	Hex offset
Array member 12 type	00035C - 00035F
Array member 12 serial number	000360 - 000367
Array member 12 worldwide ID	000368 - 00036F
Array member 12 expected unit address	000370 - 000373
Array member 12 current unit address	000374 - 000377
Array member 13 type	000378 - 00037B
Array member 13 serial number	00037C - 000383
Array member 13 worldwide ID	000384 - 00038B
Array member 13 expected unit address	00038C - 00038F
Array member 13 current unit address	000390 - 000393
Array member 14 type	000394 - 000397
Array member 14 serial number	000398 - 00039F
Array member 14 worldwide ID	0003A0 - 0003A7
Array member 14 expected unit address	0003A8 - 0003AB
Array member 14 current unit address	0003AC - 0003AF
Array member 15 type	0003B0 - 0003B3
Array member 15 serial number	0003B4 - 0003BB
Array member 15 worldwide ID	0003BC - 0003C3
Array member 15 expected unit address	0003C4 - 0003C7
Array member 15 current unit address	0003C8 - 0003CB
Array member 16 type	0003CC - 0003CF
Array member 16 serial number	0003D0 - 0003D7
Array member 16 worldwide ID	0003D8 - 0003DF
Array member 16 expected unit address	0003E0 - 0003E3
Array member 16 current unit address	0003E4 - 0003E7
Array member 17 type	0003E8 - 0003EB
Array member 17 serial number	0003EC - 0003F3
Array member 17 worldwide ID	0003F4 - 0003FB
Array member 17 expected unit address	0003FC - 0003FF
Array member 17 current unit address	000400 - 000403

Table 59. Format 17

Description	Hex offset
Associated IOA type and model	0001C4 - 0001CB
Associated IOA serial number	0001CC - 0001D3
Associated IOA worldwide ID	0001D4 - 0001DB
Type of adapter connection (1 = Dual storage IOA pair, 2 = Storage IOA to auxiliary cache)	0001DC - 0001DC
Problem description	0001E0 - 00021F

Table 60. Format 20

Description	Hex offset
Problem description	0001C4 - 000203
Path 1 adapter port	00020A
Path active (00 = Unknown, 01 = Yes, 10 = No, 11 = Unknown)	00020D, bit 0 - 1
Path state (0000 = Unknown, 0001 = Operational, 0010 = Degraded, 0011 = Failed)	00020D, bit 4 - 7
Node 1 port type (0000 = Empty, 0001 = Adapter, 0010 = Expander, 0011 = Device, 0100 = LUN)	000210, bit 0 - 3
Node 1 status (0000 = Operational, 0001 = Degraded, 0010 = Failed, 0011 = Suspect, 0100 = Missing, 0101 = Not valid)	000210, bit 4 - 7
Node 1 phy	000212
Node 1 information (1000 = 1.5 Gbps, 1001 = 3.0 Gbps)	000213, bit 4 - 7
Path 1 Node 1 SAS address	000214 - 00021B
Additional nodes are self defining	

Hexadecimal Product Activity Log data

Use the *Display Hexadecimal Report Function* or follow the steps below to display hexadecimal error log dump data.

Perform the following:

1. Find an entry in the Product Activity Log for the symptom (SRC) you are using to locate the problem.
 - a. Select System Service Tools (SST).
If you cannot get to SST, select DST.

Note: Do not IPL the system to get to DST.

- b. On the *Service Tools* display, select the *Start a service tool* option.
 - c. Select the *Product activity log* option on the *Start a Service Tool* display.
 - d. Select the *Analyze log* option on the *Product Activity Log* display.
 - e. On the *Select Subsystem Data* display, select the option to view *All Logs*.

Note: If the SRC you are using occurred more than 24 hours ago, change the “From:” and “To:” Dates and Times from the 24-hour default.

- f. Use the defaults on the *Select Analysis Report Options* display by pressing the Enter key.
 - g. Find the entry in the Product Activity Log that matches that SRC.
2. Select the *Display Detail Report for Resource* display. (See the example of this display below.)

Display Detail Report for Resource

Name	Type	Model	Serial Number	Resource Name
STORAGE	6512	001	10-4294009	SI05

Log ID	:	06020132	Sequence	:	2248
Date	:	05/20/95	Time	:	08:37:55
Reference code	:	3400	Secondary code	:	00000000
Table ID	:	65120001	IPL source/state	:	B/7

Class : Permanent
System Ref Code : 65123400
I/O processor card detected device error

Press Enter to continue.

F3=Exit
F9=Address Information

F6=Hexadecimal report
F10=Previous detail report
F12=Cancel

Figure 73. Example Hexadecimal Detail Report for Resource

3. Press F6 to display the hexadecimal report.
The direct select address (DSA) is in the format BBBB-Cc-bb:
 - BBBB = hexadecimal offsets 4C and 4D
 - Cc = hexadecimal offset 51
 - bb = hexadecimal offset 4F

Display Hexadecimal Report for Resource

Name	Type	Model	Serial Number	Resource Name	
STORAGE	6512	001	10-4294009	SI05	
Offset	0 1 2 3	4 5 6 7	8 9 A B	C D E F	EBCDIC
000000	C5D3F0F4	00000160	00E00180	77B7695E	EL04...-.....;
000010	E8A70000	000008C8	20E00602	01320000	Y.....H.....
000020	34000000	11000000	00000000	009C0000
000030	F6F5F1F2	F0F0F140	F1F060F4	F2F9F4F0	6512001 10-42940
000040	F0F9F6F5	F1F20000	00000001	00060000	096512.....
000050	00020000	FFFFFFFF	FFFFFFFF	FFFF0000
000060	00000000	00000000	00000000	F44040404
000070	40000000	00000000	00000000	00000000
000080	00000000	00000000	00000000	00000000
000090	00000000	00000000	00000000	00000000
0000A0	00000000	00000000	00000000	00000000
0000B0	00000000	00000000	40404040	40404040
More...					
Press Enter to continue.					
F3=Exit F12=Cancel					

Figure 74. Example Hexadecimal Report for Resource

4. Is offset 170 - 173 = 00000000?

- **Yes:** Continue with step 5.
- **No:** Continue with step 6 on page 689.

5. Page forward until you locate the offset location X'000180'.

If the rightmost hex digit of offset 000182 is 8, then the unit address is hexadecimal offset 18C through 18F.

If the rightmost hex digit of offset 000182 is 2, then the unit address is hexadecimal offset 192 through 195

Record this address information. Return to the procedure that sent you here, if one.

Display Hexadecimal Report for Resource

Name	Type	Model	Serial Number	Resource Name
STORAGE	6512	001	10-4294009	SI05
Offset	0 1 2 3 4 5 6 7 8 9 A B C D E F			EBCDIC
000180	D0007800	65120001	34000620	1100FFFF }.....
000190	FFFFFFFF	31090000	00001100	03C00000{..
0001A0	00000000	00000000	00000000	00000000
0001B0	00000000	00000000	00000000	00000000
0001C0	00000000	00000000	00000000	E0000008
0001D0	00000000	00000000	00000000	00000000
0001E0	00000018	00000002	E00401F0	10002000 .....0...
0001F0	00000000	40000000	00000000	000002CC
000200	CCCC0000	00000000	00800000	00000000
000210	08100000	00000000	F0200040	00800000 .....0..
000220	00000000	04000000	08000040	E000E221 .....S.
000230	800084F3	00000002	0000001B	110003C0 ...3.....{
More...				
Press Enter to continue.				
F3=Exit F12=Cancel				

Figure 75. Hexadecimal Report for Resource Offset Location Example (where the rightmost hex digit of offset 000182 is 8)

Display Hexadecimal Report for Resource

Name	Type	Model	Serial Number	Resource Name
STORAGE	571A	001	10-4294009	DC01
Offset	0 1 2 3 4 5 6 7 8 9 A B C D E F	EBCDIC		
000180	F8407200	F5F7F1C1	F0F0F0F1	3400031D
000190	00233104	00FFFFFF	F0F0F0F0	F0F0F0F0
0001A0	1104E255	F0F0F0F0	F0F0F0F0	40404040
0001B0	40404000	00FF0000	04440000	A1D0038D
0001C0	0713000C	00000000	00000000	70000200
More...				
Press Enter to continue.				
F3=Exit F12=Cancel				

Figure 76. Hexadecimal Report for Resource Offset Location Example (where the rightmost hex digit of offset 000182 is 2)

- Using hexadecimal arithmetic, add the value in offsets 170 - 173, the value in offsets 174 - 177, and 00000002. For example, 000001C8 + 00000410 + 00000002 = 000005DA
If the value of the rightmost hex digit at this offset is 8: Using hexadecimal arithmetic, add 0000000A to the offset you calculated. This will be the location of the unit address in the form abcdefgh. For example, 00005DA + 0000000A = 000005E4
If the value of the rightmost hex digit at this offset is 2: Using hexadecimal arithmetic, add 00000010 to the offset you calculated. This will be the location of the unit address in the form abcdefgh. For example, 00005DA + 00000010 = 000005EA
Record this address information. If you were sent here by another procedure, return to the procedure that sent you here.
This ends the procedure.

Reclaiming IOP cache storage

Use this procedure to reclaim IOP cache storage.

1. If you are not already using Dedicated Service Tools, perform an IPL to DST. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
Did you get to DST with a Type D IPL?
 - **No:** Continue with the next step.
 - **Yes:** Perform the following:
 - a. Select **Work with disk units** → **Reclaim IOP cache storage**.
 - b. Follow the on-line instructions to reclaim cache storage. The system will automatically perform an IPL to a Disk Configuration Attention Report or a Disk Configuration Warning Report display. Select the option to display the report. Because the Reclaim Cache Storage was selected after a D-IPL, the system will now require another Reclaim Cache Storage to be performed.
2. Select **Work with disk units** → **Work with disk unit recovery** → **Reclaim IOP Cache Storage**.
3. Follow the on-line instructions to reclaim cache storage. Depending on the reason for performing the Reclaim IOP Cache procedure, there may be a message requiring the ASP be cleared before performing this option, or a message stating the number of lost sectors.

Note: If there are lost sectors, some objects may be damaged. The customer may have to load the damaged objects again.

When the IOP performs a Reset/Reload, if there is a storage IOA attached that is running the local load source, Cxxx xxxx codes will be displayed in the system control panel. The DST console may then have a blank screen with 01B displayed on the system control panel for up to 15 minutes before it is restored.

This ends the procedure.

Working with Storage Dumps

A main storage dump (MSD) is a process of collecting data from the system's main storage. For more information on main storage dumps, including POWER5 platform system dumps, see [Performing a platform or main storage dump](#).

A main storage dump can be performed in the following ways:

- Automatically - by the service processor as the result of a system failure.
- Manually - by using control panel functions when the system waits, loops, or appears to have an operating system failure.

Dedicated Service Tools (DST)

Dedicated service tools (DST) is used to service Licensed Internal Code (LIC), work with disk units, work with configuration and resources, verify devices and communications, and display logs on the system.

DST operates in stand-alone, limited, and full paging environments. The DST tools and functions vary depending on the paging environment and the release level of the operating system.

Dedicated Service Tools requirements

Note: It is a requirement to change the password the first time anyone signs on to DST or SST. The authorized service provider needs to give the new (changed) password to the customer or have the customer change the password.

To use DST, you must have the following items:

- The disk that contains the Licensed Internal Code (the load-source disk).

Note: When you perform an alternate initial program load (IPL) to DST, you do not need the load-source disk.

- An operational workstation on bus 1 as either a primary console or an operations console.
- One workstation for each system partition.
- A valid service tools user ID and password to sign on to DST. IBM supplies service tools user IDs that have different levels of privileges.

To make a printout, attach the printer to the workstation I/O processor or storage media unit that is performing the service function. The printer that is used with DST for service tool output must be an SCS-type data stream printer.

“Accessing Dedicated Service Tools”

Covers how to start Dedicated Service Tools.

“Start a service tool” on page 697

“IPL type, mode, and speed options” on page 697

Set the IPL options from function 02 on the control panel. To permanently change the IPL speed use the CHGIPLA command.

Accessing Dedicated Service Tools

Covers how to start Dedicated Service Tools.

You can start dedicated service tools (DST) in several ways:

- Performing an IPL to DST (see “Performing an IPL to DST” on page 695).
- Pressing the System Request key while the system is operational.
- Selecting function 21 while the system is operational (see “Selecting function 21 from the control panel” on page 693).

This is available from the primary partition only.

- Performing an alternate IPL to DST (type D IPL) (see “Performing an alternate IPL to DST (type D IPL)” on page 696).

After performing a type D IPL on a primary partition, the first step in DST must be configuration recovery.

- Using the function key F16, which is not displayed, while in DST debug mode during a step-mode IPL.

“Selecting function 21 from the control panel” on page 693

Provides detailed instructions on selecting function 21 while the system is operational.

“Control panel function codes on the HMC”

Learn about the control panel function codes used to indicate status and function options for a system that is managed by a Hardware Management Console (HMC).

“Performing an IPL to DST” on page 695

This procedure is for the entire system, or if logical partitions are installed, for the primary partition.

“Performing an alternate IPL to DST (type D IPL)” on page 696

An alternate IPL to DST is called a type D IPL or a stand-alone IPL by service representatives.

Selecting function 21 from the control panel

Provides detailed instructions on selecting function 21 while the system is operational.

Perform the following steps:

1. Select control panel Function 21 (Make DST available).

Select Manual mode, then push the Increment (↑) or Decrement (↓) button on the control panel until 21 appears in the Function/Data display. Press the Enter button on the control panel.

Notes:

- a. If you enter Function 21 and the primary console is powered off or not usable, reference code A600 500x appears on the control panel. Enter Function 21 again to force the DST Sign On display to appear on one of the alternative consoles.
2. Primary console or alternate console will display the DST sign on.

Note: For more information on how to identify the primary console, see “Determining a primary or alternative console” on page 644.

3. Sign-on to DST.

Type QSRV as the valid user ID and get the password from the customer. If the customer has changed the full DST authority user ID or password, ask the customer for the correct values.

Note:

- If prompted for a password, be sure to give the new (changed) password to the customer.
 - Since V5R1, you are limited to three sign on attempts to DST. After three unsuccessful attempts, the service tools user ID will be disabled. The system administrator with QSECOFR authority will need to reset the ID.
4. The Use Dedicated Service Tools (DST) display appears.
The system is in the full paging environment.

This ends the procedure.

Control panel function codes on the HMC

Learn about the control panel function codes used to indicate status and function options for a system that is managed by a Hardware Management Console (HMC).

If you are managing the system with the Hardware Management Console (HMC), use the HMC to perform control panel functions. Servers without physical panels require the HMC to perform the equivalent control panel functions. The HMC affects the physical control panel in the following ways:

- Except for some limited auto-platform override function, such as Auto Power On Restart and Timed Power On, the system operating mode value no longer has meaning.
- The operating system IPL-type value is disabled in functions 01 and 02.
- Functions 11-19 do not display partition system reference codes (SRCs). They continue to display SRCs from the platform Licensed Internal Code (LIC).
- Functions 21, 22, 34, and 65-70 are not selectable on the physical control panel.

The following table lists the control panel functions that you can perform on the HMC.

Function	Description
01	<ol style="list-style-type: none"> Displays the currently selected IPL type (and logical key mode on some system types). Displays the currently selected IPL speed override for the next IPL. <p>This function is available in both normal and manual operating mode.</p>
02	Performs a slow boot. This function is available in both normal and manual operating mode.
03	Performs a re-IPL. The IPL uses the selected IPL options. This function is available only in manual operating mode and when the system power is on.
04	Performs a lamp test; all displays and indicators are switched on. This function is available in both normal and manual operating mode.
05-06	Reserved.
07	Allows you to set SPCN configuration IDs. This function is available only in manual operating mode when the system is in standby.
08	Causes a fast power off. This function is available only when the system is in manual operating mode and the system power is on.
09-10	Reserved.
11-19	Displays a system reference code (SRC) on the control panel. These functions are available in both normal and manual operating mode when an SRC is available.
20	Displays the machine type, model, processor feature code, processor class indicator, and IPL path description. This function is available in both normal and manual operating mode.
21	Causes the Use Dedicated Service Tool (DST) display to appear on the system console. This function is available only in the manual operating mode and when activated by the operating system.
22	Forces a partition dump. This function is available only in the manual operating mode and when activated by the operating system.
23-24	Reserved.
25-26	Not applicable.
27-29	Reserved.
30	Displays CEC FSP IP address and location. This function is available only in the manual operating mode and when activated by the FSP.
31-33	Reserved.
34	Retries the partition dump. This function is available only in the manual operating mode and when activated by the operating system.
35-41	Reserved.
42-43	Not applicable.
44-49	Reserved.
50-52	Reserved.
53	Unconfigures an intermittently failing processor (repeat GARD function). This function is available only in the manual operating mode.
54	Reserved.
55	Platform dump override. This function is available only in the manual operating mode when activated by the FSP and when CE scroll ranges are enabled.
56-62	Reserved.
63	Progress indicator history. This function is available only in the manual operating mode.
64	Diagnostic status SRC trace. This function is available only in the manual operating mode.

Function	Description
65	Deactivates remote service. This function is available only in the manual operating mode when activated by the operating system and when CE scroll ranges are enabled.
66	Activates remote service. This function is available only in the manual operating mode when activated by the operating system and when CE scroll ranges are enabled.
67	Disk unit I/O processor (IOP) reset/reload is enabled only by specific disk unit SRCs. This function is available only in the manual operating mode when activated by the operating system and when CE scroll ranges are enabled.
68	Turns off power domains during concurrent maintenance of IOPs and IOAs. This function is available only in the manual operating mode when activated by the operating system and when CE scroll ranges are enabled.
69	Turns on power domains during concurrent maintenance of IOPs and IOAs. This function is available only in the manual operating mode when activated by the operating system and when CE scroll ranges are enabled.
70	Dump service processor control storage. Initiates an I/O processor (IOP) dump; enabled by specific error conditions. This function is available only in the manual operating mode when activated by the operating system and when CE scroll ranges are enabled.

Performing an IPL to DST

This procedure is for the entire system, or if logical partitions are installed, for the primary partition.

Perform the following steps:

1. Select a type B IPL in Manual mode.

Attention: For systems with logical partitions, performing an IPL on the primary partition causes the secondary partitions to be powered down. Failing to power down these secondary partitions will cause an abnormal power-down on the secondary partitions and possible loss of data.

2. Perform one of the following:

- **If there is a problem log entry after powering on the system**, perform a delayed power-off. (This is the data for problem analysis.) When the system is off, press the Power button on the control panel to perform an IPL. Select Function 03 if the delayed power-off takes longer than 40 minutes to complete.

Attention: Performing Function 03 may cause damage to objects, and it may also cause data loss.

- **If there is an attention light after powering on the system**, use the Increment (↑) or Decrement (↓) button to select control panel Function 03. Press Enter on the control panel to perform an IPL.
- **When the system is powered off**, press the Power button on the control panel to perform an IPL.

The IPL or Install the System display appears on the primary console.

3. Select the *Use Dedicated Service Tools* option. The DST Sign On display appears.

For more information on how to identify the primary console, see “Determining a primary or alternative console” on page 644.

4. Sign on to DST with a valid user ID and password.

Remember: Enter a valid user ID and get the password from the customer. If the customer has changed the full DST authority, user ID, or password, ask the customer for the correct values.

Note:

- If prompted for a password, be sure to give the new (changed) password to the customer.

- You are limited to three sign on attempts to DST. After three unsuccessful attempts, the service tools user ID will be disabled. A user ID with a service tool security privilege must reset the ID.

The Use Dedicated Service Tools (DST) display appears.

Restriction: The system is in the limited paging environment.

This ends the procedure.

Performing an alternate IPL to DST (type D IPL)

An alternate IPL to DST is called a type D IPL or a stand-alone IPL by service representatives.

An alternate IPL to DST is called a type D IPL or a stand-alone IPL by service representatives. Perform the following steps:

1. To use an alternate installation device, select the DST option to *Work with alternate installation device*. This option is available in DST from control panel function 21 or a type D IPL.
2. Determine the removable media unit or units for an alternate IPL. Power on the removable media units.
3. Place the media that contains the Licensed Internal Code (first tape of the customer's system save, the SAVLIC, ISMD tapes, or optical device) in the removable media units. Load the media and make the media units ready. See the device information for instructions on loading the removable media.
4. Power off the system. If the system is running, end all jobs and perform the power down procedure.
5. Select a type D IPL in Manual mode.

For information on how to select IPL options, see "IPL type, mode, and speed options" on page 697.

6. Power on the console.

For more information on how to identify the primary console, see "Determining a primary or alternative console" on page 644.

7. Load the media and make the media unit ready.
8. Press the Power button to power on the system.

Notes:

- a. Some types of removable media units automatically reset. In this condition, SRC A100 1933 (Media device not ready) may be displayed.
 - b. If the installation device is an optical device, you may need to IPL the system again. This action will make the unit ready.
`pwrdownsys restart(*yes) IPL(D)`
 - c. If the installation device is a tape unit, system reference code (SRC) A1001933 is displayed until the device automatically makes itself ready.
 - d. The removable media becomes active. There is a delay while the system loads information from the load source. While running a process, the system continuously updates SRCs on the control panel that show the status.
9. Wait for the Install Licensed Internal Code display to appear on the console. The wait varies depending on the speed of the removable media unit and the processor speed for the specific system model.

Notes:

- a. If SRC A600 500x is displayed on the control panel, the system was not able to locate the console.
Ensure that the console is powered on (repair if necessary). Select Function 21 on the control panel (see "Selecting function 21 from the control panel" on page 693) to make DST available.

- b. If an SRC other than A600 500x is displayed on the control panel, go to “Starting Point for All Problems” in the Problem Analysis information for your system.
10. The Install Licensed Internal Code display appears on the console.
 - If you want to access DST, select the *Work with Dedicated Service Tools (DST)* option and continue to the next step of this procedure.
 - If you want to install or restore Licensed Internal Code, select the *Install Licensed Internal Code* option and continue with the install or restore instructions.
 - If you want to define the device from which the system LIC should be installed, select the *Define alternate installation device* option. This option also allows you to enable or disable the alternate installation device.
11. Reapply PTFs.
12. Sign on to DST as QSRV.

Type QSRV as the valid user ID and get the password from the customer. If the customer has changed the full DST authority user ID or password, ask the customer for the correct values.

Note:

- a. If prompted for a password, be sure to give the new (changed) password to the customer.
 - b. You are limited to three sign on attempts to DST. After three unsuccessful attempts, the service tools user ID will be disabled. The system administrator with QSECOFR authority will need to reset the ID.
13. The Use Dedicated Service Tools (DST) display appears. Options are limited because the system is in the stand-alone environment.

This ends the procedure.

Start a service tool

Select this option from the Use Dedicated Service (DST) Tools display.

Note: The *Start a service tool* option is also available from the System Service Tools (SST) display.

The following options are available from the Start a Service Tool display:

- Display / alter dump
- Licensed Internal Code log
- Licensed Internal Code trace
- Hardware service manager
- Main storage dump manager
- Product activity log
- Operator panel functions
- Performance data collector
- (available only on systems with SST)

IPL type, mode, and speed options

Set the IPL options from function 02 on the control panel. To permanently change the IPL speed use the CHGIPLA command.

Note: Systems managed by the Hardware Management Console (HMC) should use the HMC to perform control panel functions.

- Use function 01 to display the current IPL option, including IPL speed. This is the option and speed that the system will use at the next IPL.

- Use the HDWDIAG (hardware diagnostics) parameter of the CHGIPLA command to permanently change the IPL speed. The values are: The default shipped value *MIN (minimal) for fast diagnostics and *ALL for all (full) diagnostics.

IPL speed recommendations

- Use CHGIPLA *MIN, or Function 02 F or V=F for most IPLs (to perform a fast IPL that uses minimum diagnostics).
- Use CHGIPLA *ALL, or Function 02 S or V=S, if you change hardware or suspect an intermittent hardware failure (to perform a slow IPL that uses all diagnostics).
- Use CHGIPLA *ALL, or Function 02 S or V=S during the first Install IPL. You can set this at the panel with Function 02; it affects only the one IPL because the next IPL will again pick up the value set with CHGIPLA.

Printing the System Configuration List

The System Configuration List printout consists of the following sections (80-character width):

1. System information
 - System type, model, serial number, and release
2. Packaging hardware resource information
 - Resource name, type-model, serial number, part number, frame ID, card position, and device position
3. Logical hardware resource information
 - Resource name, type-model, serial number, and logical address
4. Legend
 - Descriptions of the indicators
 - Logical address format information

132-character width printouts consist of the following:

- description
- type-module
- serial number
- location data
 - frame ID
 - device position
 - card position
- logical resource name
- part number
- logical address

You can sort the printout by location or logical address data.

Print the system configuration list

To print the system configuration list, perform the following procedure:

1. On the Start a Service Tool display, select the *Hardware service manager* option.
2. Select the *Print* (F6) function key on the Hardware Service Manager display to request a printout.
3. The Print Format Options display appears. You can sort the information by location or logical address.

Note: The logical address sort and location sort are available only in 132-character width.

4. Look for the system configuration list printout.

Notes:

- a. If you select the *Print* function key from a display other than the Hardware Service Manager display, only the information that appears on the display will print.
- b. Use the last page of the printout (the legend) to assist in interpreting the information.
- c. The logical and packaging hardware resources have unique resource names.
- d. You can also view logical address information online from the product activity log.

This ends the procedure.

To collect more details on the information that is listed on the system configuration list, select the *Print* function key from a display other than the Hardware Service Manager display.

Note: The entire system configuration list will not print. Only the information that appears on the display will print.

Details on the system bus, main storage, or processor

For details (that include descriptions) on the system bus, main storage, or processor, perform the following procedure:

1. Select the *Logical hardware resources* option on the Hardware Service Manager display.
2. On the Logical Hardware Resources display, select one of the following options to display details:
 - System bus resources
 - Processor resources
 - Main storage resources
 - High-speed link resources
3. Use the *Print* function key to print the information.

This ends the procedure.

Hardware Service Manager

You can select the *Hardware service manager* option from the Start a Service Tool display. It allows you to display and work with system hardware (logical or packaging) and debug input-output processors (IOP) and devices.

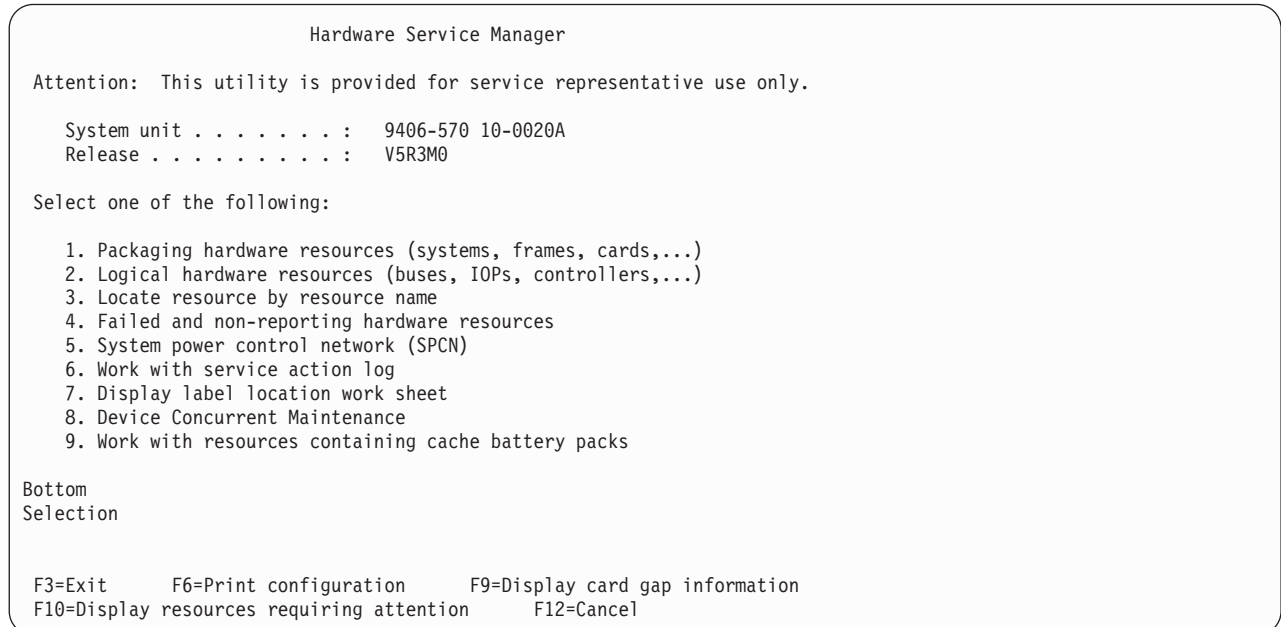


Figure 77. Example Hardware Service Manager display (in the full and limited paging environments)

Note: The system power control network (SPCN) option appears only on systems with SPCN.

The Hardware Service Manager display provides the following information:

- System type, model, and serial number
- Licensed Internal Code and operating system release information
- A list of the hardware service manager options

The options available vary depending on the system type and paging environment.

- Function keys

The function keys vary depending on the display that is shown.

Managing the Advanced System Management Interface (ASMI)

Understand how to manage the Advanced System Management Interface (ASMI).

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power. The ASMI may also be referred to as the service processor menus.

Use the following information to help you manage the ASMI:

- “Accessing the ASMI using a Web browser”
- “Accessing the ASMI using an ASCII terminal” on page 704
- “Accessing the ASMI using the HMC” on page 705

“Accessing the ASMI”

You can access the ASMI through a Web browser or an ASCII console.

“Displaying error and event logs” on page 705

Display a list of all of the error and event logs in the service processor.

“Setting the system enclosure type” on page 706

Set values that uniquely identify the type of enclosures attached to the system.

“Setting the system identifiers” on page 707

Set the system-unique ID, system serial number, machine type, and machine model.

“Viewing vital product data” on page 707

View selected or all manufacturer’s VPD, such as serial numbers and part numbers.

“Clearing all deconfiguration errors” on page 708

Clear error records for specific or all resources in the system.

Accessing the ASMI

You can access the ASMI through a Web browser or an ASCII console.

“Accessing the ASMI using a Web browser”

Connect a PC or mobile computer to the server to access the ASMI. The Web interface to the ASMI is available during all phases of system operation including the initial program load (IPL) and run time.

“Accessing the ASMI using an ASCII terminal” on page 704

Connect the ASCII console to the server to access the ASMI.

“Accessing the ASMI using the HMC” on page 705

Access the ASMI through the HMC interface.

Accessing the ASMI using a Web browser

Connect a PC or mobile computer to the server to access the ASMI. The Web interface to the ASMI is available during all phases of system operation including the initial program load (IPL) and run time.

The Web interface to the Advanced System Management Interface (ASMI) is accessible through Microsoft® Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 running on a PC or mobile computer connected to the service processor. The Web interface is available during all phases of system operation including the initial program load (IPL) and run time. However, some of the menu options in the Web interface are unavailable during IPL or run time to prevent usage or ownership conflicts if the system resources are in use during that phase.

Note: To perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power, you must set up the ASMI.

The following instructions apply to systems that are not connected to an HMC. If you are managing the server using an HMC, “Accessing the ASMI using the HMC” on page 705.

To set up the Web browser for direct or remote access to the ASMI, complete the following tasks:

1. Connect the power cord from the server to a power source, and wait for the control panel to display 01.
2. Select a PC or mobile computer that has Microsoft Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 to connect to your server.
If you do not plan to connect your server to your network, this PC or mobile computer will be your ASMI console.
If you plan to connect your server to your network, this PC or mobile computer will be temporarily connected directly to the server for setup purposes only. After setup, you can use any PC or mobile computer on your network that is running Microsoft Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 as your ASMI console.
3. Connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC1 on the back of the managed system. If HMC1 is occupied, connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC2 on the back of the managed system.
4. Configure the Ethernet interface on the PC or mobile computer to an IP address and subnet mask within the same subnet as the server so that your PC or mobile computer can communicate with the server. Use the following table to help you determine these values:

Table 61. PC or mobile computer network configuration information

Server connector	Subnet mask	IP address
HMC1	255.255.255.0	169.254.2.147
HMC2	255.255.255.0	169.254.3.147

For example, if you connected your PC or mobile computer to HMC1, the IP address for your PC or mobile computer could be 169.254.2.1 and the subnet mask would be 255.255.255.0. Set the gateway IP address to the same IP address as the PC or mobile computer.

5. Use Table 61 to determine the IP address of the Ethernet port that your PC or mobile computer is connected to, and type the IP address in the Address field of your PC's or mobile computer's Web browser. For example, if you connected your PC or mobile computer to HMC1, type <https://169.254.2.147> in your PC's or mobile computer's Web browser.
6. When the login display appears, enter one of the following default user IDs and passwords:

Table 62. Default user IDs and passwords for the Web interface

User ID	Password
general	general
admin	admin

7. Change the default password when prompted.
8. If you plan to connect your PC or mobile computer to your network, complete the following steps:
 - a. From the navigation area, expand **Network Services**.
 - b. Click **Network Configuration**.
 - c. If your PC or mobile computer is connected to HMC1, fill in the section labeled Network interface eth0.
If your PC or mobile computer is connected to HMC2, fill in the section labeled Network interface eth1.

Ensure that the following fields are filled in correctly.

Table 63. Fields and values for network configuration

Field	Value
Configure this interface?	Selected
Type of IP address	Static
IP address	This is the same address that you used in step 5 on page 703.
Subnet mask	255.255.255.0

- d. Click **Save Settings**.
- e. Disconnect your PC or mobile computer from the server.
- f. Connect the server to your company network.
- g. Go to any PC or mobile computer on your company network that is running Microsoft Internet Explorer 6.0, Netscape 7.1, or Opera 7.23, and type the following in the Address field of your browser:

https://host name.domain name

where *host name* and *domain name* are the host name and domain name you entered when completing step 8c on page 703.

- h. Log in to the ASMI.
9. Set the time of day on the server.

Accessing the ASMI using an ASCII terminal

Connect the ASCII console to the server to access the ASMI.

The ASCII interface to the ASMI provides a subset of the Web interface functions. The ASCII console is available only when the system is in platform standby state. It is not available during the initial program load (IPL) or run time. The ASMI on an ASCII console is not available during some phases of system operation, such as the initial program load (IPL) and run time.

To set up the ASCII console for direct or remote access to the ASMI, complete the following tasks:

1. Complete the following steps to cable an ASCII console or equivalent to the server:
Using a cable equipped with a null modem, connect the ASCII console to system connector S1 1 on the back of the server or to system port FS1 on the control panel using an RJ-45 connector.

Note: Both system port 1 connections are not available simultaneously; when one is connected, the other is deactivated.

2. Connect the power cord from the server to a power source.
3. Wait for the control panel to display 01.
4. Ensure that your ASCII console is set to the following general attributes.

These attributes are the default settings for the diagnostic programs. Be sure your terminal is set to these attributes before proceeding to the next step.

General setup attributes	3151 /11/31/41 settings	3151 /51/61 settings	3161 /64 settings	Description
Line speed	19,200	19,200	19,200	Uses the 19,200 (bits per second) line speed to communicate with the system unit.

General setup attributes	3151 /11/31/41 settings	3151 /51/61 settings	3161 /64 settings	Description
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).

- Press a key on the ASCII console to allow the service processor to confirm the presence of the ASCII console.
- When the login display appears, enter one of the following default user IDs and passwords:

Table 64. Default user IDs and passwords for the Web interface

User ID	Password
general	general
admin	admin

- Change the default password when you are prompted.
- Set the time of day on the server.

Accessing the ASMI using the HMC

Access the ASMI through the HMC interface.

To access the Advanced System Management Interface (ASMI) using the Hardware Management Console (HMC), complete the following steps:

- Ensure that the HMC is set up and configured.
- In the navigation area, ensure that the server you are working with is selected.
- Expand and click **Operations**.
- In the content area, click **Advanced System Management (ASMI)**.
- Log on to the ASMI using the administrator userid and password.

Displaying error and event logs

Display a list of all of the error and event logs in the service processor.

You can view error and event logs that are generated by various service processor firmware components. The content of these logs can be useful in solving hardware or server firmware problems.

To perform this operation, your authority level must be one of the following:

- General
- Administrator
- Authorized service provider

Informational and error logs can be viewed by all authority levels. Hidden error logs can be viewed by authorized service providers.

The following table shows error log types that might be displayed, the conditions that make an error log specific to that error log type, and the user authority level that will allow you to view specific types of error logs:

Error log type	Conditions		User availability
	Severity	Action	
Informational logs	Informational	Report to operating system (OS) but not hidden	Available to all users
Error logs	Not informational	Report to OS but not hidden	Available to all users
Hidden logs	Not informational and informational	Report to OS, hidden, or both	Available only to the authorized service provider and users with higher authority.

To view error and event logs in summary or full detailed format, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Service Aids** and click **Error/Event Logs**. If log entries exist, a list of error and event log entries is displayed in a summary view.
3. To view the full detail format of any of the logs listed, select the log's corresponding check box and click **Show details**. When multiple logs are selected, any action applies to each selected log. The full detail information might span several pages. The contents and layout of the full detail output is defined by the event or error logging component.
4. Click **Mark as reported** to mark platform error entries whose underlying causes have been resolved. By doing so, these entries are not reported to the operating system again when the system reboots. After they are marked, these errors can be overwritten by other errors logged in the service processor history log.

Note: The **Mark as reported** button is available only when your authority level is an authorized service provider.

Setting the system enclosure type

Set values that uniquely identify the type of enclosures attached to the system.

When setting the system enclosure type, ensure that the enclosure serial number field matches the original value, which can be found on a label affixed to the unit. Updating the enclosure serial field keeps the configuration and error information synchronized, and this information is used by the system when creating the location codes. This task must be done using the ASMI, not with the control panel. However, if you do not have access to the ASMI, the system will still operate without updating this information.

For example, when replacing the I/O backplane, you must re-enter the original enclosure serial number into the enclosure serial number field to overwrite the serial number that is recorded for the new I/O backplane. Failure to enter the correct enclosure serial number will result in logical partition mappings being incorrect.

Note: You cannot boot the system until valid values are entered for all fields in the enclosure-type information.

To perform this operation, your authority level must be one of the following:

- Administrator
- Authorized service provider

To change the system enclosure type, complete the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.

2. In the navigation area, expand **System Configuration** → **Program Vital Product Data**.
3. Select **System Enclosures**. In the right pane, the current system enclosures are displayed.
4. Enter the desired settings for the **Enclosure location**, **Feature Code/Sequence Number**, and **Enclosure serial number** fields using the naming convention described in the ASMI help.
The value of the **Enclosure serial number** field is different than the serial number of the system. Set the **Reserved** field to blank spaces unless directed otherwise by Level 3 technical support.
5. Click **Save settings** to update the system enclosure type information and save it to the VPD.

Setting the system identifiers

Set the system-unique ID, system serial number, machine type, and machine model.

You can set the system-unique ID, serial number, machine type, and machine model. If you do not know the system-unique ID, contact your next level of support.

To perform this operation, your authority level must be one of the following:

- Administrator
- Authorized service provider

Note: You cannot boot the system until valid values are entered for all fields. You can change these entries only once.

To set the system keywords, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration** and **Program Vital Product Data**.
3. Select **System Keywords**.
4. In the right pane, enter the desired values for the system serial number, machine type, and machine model using the naming convention shown in the ASMI help. Set the **Reserved** field to blank spaces unless directed otherwise by service and support.
5. Click **Continue**. The data validation panel is displayed, which includes your entered settings.
6. Click **Save settings** to update the system keywords and save them to the VPD.

Viewing vital product data

View selected or all manufacturer's VPD, such as serial numbers and part numbers.

You can view manufacturer's vital product data (VPD) stored from the system boot prior to the one in progress now.

To perform this operation, your authority level must be one of the following:

- General
- Administrator
- Authorized service provider

To view the VPD, complete the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Information** and select **Vital Product Data**.
3. A list of field replaceable units (FRUs) that exist on the system and their descriptions are displayed. Select a single FRU or multiple FRUs from this list that you would like to view.
4. Click **Display Details** to display the details for selected FRUs, or click **Display all details** to display details for all VPD entries.

Clearing all deconfiguration errors

Clear error records for specific or all resources in the system.

The ASMI allows you to clear error records for all or individual system hardware resources that include the processor, memory, L2 and L3 cache, I/O hubs, service processor card, and clock card.

To clear all deconfiguration errors, your authority level must be an authorized service provider.

Note:

- Before performing this operation, record error messages or ensure that the error record data is no longer needed; otherwise, you will lose all error data from the hardware resources.
- Upon completion of this procedure, the system must be powered off, and in standby mode, for the deconfiguration errors to be cleared.

To clear all deconfiguration errors, do the following:

1. If the server is not powered off and in standby state, ask the customer to power off the server. When the server is in standby state (the power on LED on the control panel is blinking slowly), continue with the next step.
2. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
3. In the navigation area, expand **System Configuration** and **Hardware Deconfiguration**.
4. Select **Clear All Deconfiguration Errors**.
5. In the right pane, select the desired hardware resource from the menu. You can select **All hardware resources** or an individual resource.
6. Click **Clear errors for selected hardware resource**.
7. Power on the server after clearing the deconfiguration errors. This will cause the FSP to retest the hardware as it powers on.

Service functions

Service functions provides enough detail for the service provider to gather information about hardware problems while under the direction of the next level of support.

This information provides basic information about some of the service functions that are commonly used by authorized service providers.

Before using this information, you should know how to service this particular hardware model. You must also know how to safely work with electrical components.

Attention: Misuse of service tools or using them with inappropriate security safeguards might result in loss of data, programs, or other objects on the system.

Managing dumps

After you have performed a dump, or one occurs automatically, use this information to manage the dump, including copying, reporting, and deleting it.

Dumps are deleted automatically when a new dump occurs, except for log dumps.

“Performing dumps”

Learn more about the different types of dumps that can be performed and how to manage them, including copying, reporting, and deleting them.

“Copying a dump” on page 713

Use this procedure to copy a current platform dump or current main storage dump when the Main Storage Dump auto copy option is disabled. Copying the current dump allows another dump of the same type to be created.

“Reporting a dump” on page 716

Find out how to report a dump using the HMC, i5/OS service tools, AIX command line, or Linux command line.

“Deleting a dump” on page 718

Use this procedure to delete a dump when dump copies are no longer needed by your next level of support or your hardware service provider.

Performing dumps

Learn more about the different types of dumps that can be performed and how to manage them, including copying, reporting, and deleting them.

Dumps can occur automatically after a failure or external reset, or after a manual request. The dump information provides valuable information on system status and should be reported to your next level of support or your hardware service provider.

- **Platform system dump:** A platform system dump is a collection of data from server hardware and firmware, either after a system failure or a manual request.
- **Service processor dump:** A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request.

In addition, there are other dumps that generate automatically. These include:

- **Platform event log entry dumps** (which are generated by server firmware when a platform event log entry is truncated)
- **Resource dumps**
- **SMP dumps**

“Performing a platform system or service processor dump”

A platform system dump or service processor dump is performed when your next level of support or your service provider suspects a wait or loop in the server firmware.

“Performing a service processor dump” on page 712

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request.

Performing a platform system or service processor dump

A platform system dump or service processor dump is performed when your next level of support or your service provider suspects a wait or loop in the server firmware.

Only perform a platform system or service processor dump under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

Note: Before performing a platform system dump, collect any reference code information from the control panel or the HMC.

“Using the HMC to perform a system dump”

If your next level of support or your service provider suspects a wait or loop in the server firmware, they might request that you perform a system dump. You can use the HMC to perform a system dump, which is a collection of data from the server hardware and firmware.

“Using the control panel to perform a system dump”

If your next level of support or your service provider suspects a wait or loop in the server firmware, they might request that you perform a system dump. If you do not have an HMC, you can use the control panel to perform a system dump, which is a collection of data from the server hardware and firmware.

“Using the ASMI to perform a system dump” on page 712

If your next level of support or your service provider suspects a wait or loop in the server firmware, they might request that you perform a system dump. You can use the ASMI to perform a system dump, which is a collection of data from the server hardware and firmware.

Using the HMC to perform a system dump:

If your next level of support or your service provider suspects a wait or loop in the server firmware, they might request that you perform a system dump. You can use the HMC to perform a system dump, which is a collection of data from the server hardware and firmware.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

Follow these steps to initiate a system dump.

1. Perform a controlled shutdown of all partitions.

Note: A system dump will abnormally terminate any running partitions.

2. In the navigation area, open **Systems Management**.
3. Select the server and open it.
4. Select **Serviceability**.
5. Select **Manage Dumps**.
6. Select **Action > Initiate System Dump**. The dump is automatically saved to the HMC.
7. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 710.

Using the control panel to perform a system dump:

If your next level of support or your service provider suspects a wait or loop in the server firmware, they might request that you perform a system dump. If you do not have an HMC, you can use the control panel to perform a system dump, which is a collection of data from the server hardware and firmware.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

If you do not have an HMC, follow these steps to perform a system dump:

1. Perform a controlled shutdown of the operating system.

Note: A platform system dump will abnormally terminate any running partitions.

2. On the control panel, select Manual mode.
3. Use the increment or decrement buttons to select function 42 (system dump).
4. Press Enter on the control panel.

5. Is 00000000 or FF displayed on the control panel for more than 30 seconds?
 - **Yes:** The service processor or server firmware is not responding to a request from the control panel. Contact your next level of support or your hardware service provider. **This ends the procedure.**
 - **No:** An attention SRC A1xx3042 is displayed, which indicates that function 42 has been selected.
6. Perform the following steps:
 - a. Reselect function 42 and press Enter on the control panel.
 - b. Switch back to Normal mode and wait for the dump to complete.
 - c. Wait for the system to IPL again.
7. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 710.

Using the ASMI to perform a system dump:

If your next level of support or your service provider suspects a wait or loop in the server firmware, they might request that you perform a system dump. You can use the ASMI to perform a system dump, which is a collection of data from the server hardware and firmware.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

To perform a system dump, see Initiating a system dump.

Performing a service processor dump

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request.

Only perform a service processor dump under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

“Using the HMC to perform a service processor dump”

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request. You can use the HMC to perform a service processor dump.

“Using the control panel to perform a service processor dump” on page 713

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request. If you do not have an HMC, you can use the control panel to perform a service processor dump.

“Using the ASMI to perform a service processor dump” on page 713

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request. You can use the ASMI to perform a service processor dump.

Using the HMC to perform a service processor dump:

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request. You can use the HMC to perform a service processor dump.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

Follow these steps to initiate a service processor dump.

1. In the navigation area, open **Systems Management**.
2. Select the server and open it.
3. Select **Serviceability**.
4. Select **Manage Dumps**.

5. Select **Action > Initiate System Dump**. The dump is automatically saved to the HMC.
6. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 710.

Using the control panel to perform a service processor dump:

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request. If you do not have an HMC, you can use the control panel to perform a service processor dump.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

If you do not have an HMC, follow these steps to perform a service processor dump:

1. On the control panel, select Manual mode.
2. Use the increment or decrement buttons to select function 43 (service processor dump).
3. Press Enter on the control panel.
4. Is 00000000 or FF displayed on the control panel for more than 30 seconds?
 - **Yes:** The service processor or server firmware is not responding to a request from the control panel. Contact your next level of support or your hardware service provider. **This ends the procedure.**
 - **No:** An attention SRC A1xx 3043 is displayed, which indicates that function 43 has been selected.
5. Perform the following steps:
 - a. Reselect function 43 and press Enter on the control panel.
 - b. Switch back to Normal mode, and wait for the dump to complete.
6. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 710.

Using the ASMI to perform a service processor dump:

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request. You can use the ASMI to perform a service processor dump.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

To perform a service processor dump, see Initiating a service processor dump.

Copying a dump

Use this procedure to copy a current platform dump or current main storage dump when the Main Storage Dump auto copy option is disabled. Copying the current dump allows another dump of the same type to be created.

Note: If you have an HMC, you must manage your platform dumps with the HMC.

“Using an HMC to copy a dump” on page 714

Learn how to copy a dump using an HMC.

“Using the AIX command line to copy a dump” on page 714

Learn how to use the AIX command line to copy a dump.

“Using the Linux command line to copy a dump” on page 714

Learn how to use the Linux command line to copy a dump.

“Using the IBM i5/OS service tools to copy a dump” on page 715

Learn how to use the i5/OS service tools to copy a dump.

Using an HMC to copy a dump

Learn how to copy a dump using an HMC.

Note: If you have an HMC, you must manage your platform dumps with the HMC. However, you will need to manage i5/OS main storage dumps with the IBM i5/OS service tools.

1. In the navigation area, open **Systems Management**.
2. Select the server and open it.
3. Select **Serviceability**.
4. Select **Manage Dumps**.
5. Select **Selected > Copy Dump**.
6. Select the dump to copy.
7. Verify that HMC containing the dump is the HMC being used to copy the dump.
8. To copy the dump to DVD media, select **Selected > Copy Dump File to DVD Media**.
9. Load the media and follow the instructions on the display.
10. When the copy procedure is successfully completed, remove the media and process it according to the instructions of your next level of support or your hardware service provider.
11. If you encounter a problem with the copy procedure, contact your next level of support or your hardware service provider. **This ends the procedure.**

Using the AIX command line to copy a dump

Learn how to use the AIX command line to copy a dump.

Copy the dump only if you are directed to do so by your next level of support or service provider.

Note: If you have an HMC, you must manage your platform dumps with the HMC. For details, see “Using an HMC to copy a dump.”

Platform dumps are saved in AIX under the following directory:

`/var/adm/platform`

Note: If the AIX partition becomes the service partition after it was installed, run the following command to create this directory:

```
platform_dump -f jfs2
```

or

```
platform_dump -f jfs
```

This command will create the `/var/adm/ras/platform` file system. This is done automatically during installation if the AIX partition was marked as the service partition before it was installed.

Using the Linux command line to copy a dump

Learn how to use the Linux command line to copy a dump.

Copy the dump only if you are directed to do so by your next level of support or service provider.

Note: If you have an HMC, you must manage your platform dumps with the HMC. For details, see “Using an HMC to copy a dump.”

Platform dumps are saved in Linux under the following directory:

`/var/log/dump/`

Using the IBM i5/OS service tools to copy a dump

Learn how to use the i5/OS service tools to copy a dump.

Choose from the following options:

- To copy a platform system or SP™ dump, go to “Copying a platform system or SP dump.”
- To copy a main storage dump, go to “Copying a main storage dump.”

Copying a platform system or SP dump:

Use this procedure to copy a platform system or SP dump with the i5/OS tools.

Note: If you have an HMC, you must manage your platform dumps with the HMC. For details, see “Using an HMC to copy a dump” on page 714.

1. On any command line, enter STRSST.
2. Enter a valid service tools user ID and password.
3. Select option 1 (Start a service tool).
4. Select option 6 (Main storage dump manager). Did option 7 (Work with current platform dump) appear on the Main Storage Dump Manager display?
 - **Yes:** There is a current platform dump. Continue with the next step.
 - **No:** There is no current platform dump. A dump might have been automatically copied to the Auxiliary Storage Pool (ASP). Go to “Reporting a dump” on page 716. **This ends the procedure.**
5. Select option 7 (Work with current platform dump).
6. Select option 1 (Display summary). The Platform Dump Summary display shows the platform dump type, date and time of the dump, and reference code.
7. Record the summary information and report it to your next level of support or your hardware service provider.
8. Press F12 (Cancel).
9. Select option 3 (Copy to ASP). The platform dump will be copied to disk storage. After the dump is copied, a message will be displayed indicating whether the copy completed.
10. Did a message indicate “Copy completed normally”?
 - **Yes:** There no longer is an option 7 (Work with current platform dump) listed. **This ends the procedure.**
 - **No:** Continue with the next step.
11. Has your next level of support or your hardware service provider requested a media copy of the platform dump?
 - **Yes:** Continue to the next step.
 - **No:** Work with your next level of support or your hardware service provider on the problem. **This ends the procedure.**
12. If the copy to disk failed, copy a current platform dump to removable media by performing the following steps:
 - a. Select option 2 (Copy to media).
 - b. Load the media and follow the instructions on the display.
 - c. When the copy procedure is successfully completed, remove the media and process it according to the instructions of your next level of support or your hardware service provider.
13. If you encounter a problem with the copy procedure, contact your next level of support or your hardware service provider. **This ends the procedure.**

Copying a main storage dump:

Use this procedure to copy an i5/OS main storage dump using i5/OS tools.

1. On any command line, enter STRSST.

2. Enter a valid service tools user ID and password.
3. Select option 1 (Start a service tool).
4. Select option 6 (Main storage dump manager).
5. From the Main Storage Dump Manager display, press Enter.

Note: Copying a main storage dump (MSD) to disk storage on the system prevents the MSD from being overwritten in the event that another MSD occurs.

6. Select option 1 (Display/Print).
7. Select option 1 (MSD summary). The Main Storage Dump Summary display shows the system reference code, date and time of the MSD, and Licensed Internal Code (LIC) level.
8. Record the summary information and report it to your next level of support or your hardware service provider.
9. Press F12 (Cancel) twice to return to the Work with Current Main Storage Dump display.
10. Select option 3 (Copy to ASP).
11. Type a dump description and then press Enter to start copying the dump. After the dump is copied, a message is displayed indicating whether the MSD copy completed.
12. Did a message indicate "Copy completed normally"?
 - **Yes: This ends the procedure.**
 - **No:** Continue with the next step.
13. Has your service provider requested a media copy of the MSD?
 - **Yes:** Continue to the next step.
 - **No:** Work with your next level of support or your hardware service provider on the problem. **This ends the procedure.**
14. To copy a current MSD to a removable media, perform the following steps:
 - a. Select option 2 (Copy to media).
 - b. Load the media and follow the instruction on the display.
 - c. When the copy procedure completes successfully, remove the media and process it according to your service provider's instructions. If you encounter a problem with the copy procedure, contact your next level of support or your hardware service provider. **This ends the procedure.**

Reporting a dump

Find out how to report a dump using the HMC, i5/OS service tools, AIX command line, or Linux command line.

"Using an HMC to report a dump"

Learn how to report a dump using an HMC.

"Using the AIX command line to report a dump" on page 717

Learn how to report a dump using the AIX command line.

"Using the Linux command line to report a dump" on page 717

Learn how to report a dump using the Linux command line.

"Using the i5/OS service tools to report a main storage or platform system or SP dump" on page 717

Learn how to report a dump using the i5/OS service tools.

Using an HMC to report a dump

Learn how to report a dump using an HMC.

1. In the navigation area, open **Systems Management**.
2. Select the server and open it.
3. Select **Serviceability**.
4. Select **Manage Dumps**.
5. Select **Selected > Call Home Dump**.

6. Verify that **HMC containing dump** is the HMC being used to report the dump.
7. Select **Selected** → **Call Home Dump**. The dump summary display shows the date, time and size of the dump. Report the summary information to your next level of support or your hardware service provider.
8. Has your next level of support or your hardware service provider requested a copy of the dump?
 - **Yes:** Continue to the next step.
 - **No:** Contact your next level of support or your hardware service provider on the problem.
9. To copy a dump to removable media, perform the following steps:
 - a. Select **Copy Dump File to DVD Media**.
 - b. Load the media and follow the instructions on the display.
 - c. When the copy procedure is successfully completed, remove the media and process it according to the instructions of your next level of support or your hardware service provider. If you encounter a problem with the copy procedure, contact your next level of support or your hardware service provider.
10. To copy a dump to another system, perform the following steps:
 - a. Select **Selected** → **Copy Dump File to Other System**.
 - b. Follow the instructions on the display.
 - c. When the copy procedure is complete, contact your next level of support or your hardware service provider.

Using the AIX command line to report a dump

Learn how to report a dump using the AIX command line.

Report the dump only if you are directed to do so by your next level of support or service provider.

Platform dumps are saved in AIX under the following directory:

`/var/adm/platform`

Note: If the AIX partition becomes the service partition after it was installed, run the following command to create this directory:

```
platform_dump -f jfs2
```

or

```
platform_dump -f jfs
```

This command will create the `/var/adm/ras/platform` file system. This is done automatically during installation if the AIX partition was marked as the service partition before it was installed.

Using the Linux command line to report a dump

Learn how to report a dump using the Linux command line.

Platform dumps are saved in AIX under the following directory: `/var/log/dump/`

Report the dump only if you are directed to do so by your next level of support or service provider.

Using the i5/OS service tools to report a main storage or platform system or SP dump

Learn how to report a dump using the i5/OS service tools.

If your system has the Main Storage Dump enabled for auto copy, your system might have automatically copied the current MSD to the Auxiliary Storage Pool (ASP) using the dump description Auto Copy. Then it might have performed another IPL of the system, or automatically copied a current platform system or SP dumps to ASP using the dump type as part of the dump description.

1. On any command line, enter STRSST.
2. Enter a valid service tools user ID and password.
3. Select option 1 (Start a service tool).
4. Select option 6 (Main storage dump manager).
5. Select option 2 (Work with copies of main storage dumps).
6. Find a new dump near the bottom of the list, type 5 (Display/Print) next to it, and press Enter.
7. Did the Display Main Storage Dump display appear?
 - **Yes:** This is a main storage dump. Select option 1 (MSD Summary). Continue with the next step.
 - **No:** This is a platform dump. Continue with the next step.
8. Record the summary information so that you can report it to your next level of support or your hardware service provider. The Dump Summary display shows the date and time of the dump, system reference code (SRC) data, and Licensed Internal Code (LIC) level.
9. Press F3 (Exit).
10. If the dump has a description of Auto Copy, rename it so that another auto copy and IPL can occur if necessary.
 - a. Select option 7 (Rename).
 - b. Type a new dump description, and press Enter.
11. Has your next level of support or your hardware service provider requested a media copy of the dump?
 - **Yes:** Continue with the next step.
 - **No:** Contact your next level of support or your hardware service provider on the problem. Continue with "Deleting a dump."
12. To copy an MSD or a platform dump to removable media, perform the following steps:
 - a. Select option 8 (Copy to media).
 - b. Load the media and follow the instructions on the display.
 - c. When the copy procedure completes successfully, remove the media and process it according to the instructions from your next level of support or your hardware service provider. If you encounter a problem with the copy procedure, contact your next level of support or your hardware service provider.
13. Continue with "Deleting a dump."

Deleting a dump

Use this procedure to delete a dump when dump copies are no longer needed by your next level of support or your hardware service provider.

"Using an HMC to delete a dump"

Learn how to use an HMC to delete a dump.

"Using the AIX command line to delete a dump" on page 719

Learn how to delete a dump using the AIX command line.

"Using the Linux command line to delete a dump" on page 719

Learn how to delete a dump using the Linux command line.

"Using the i5/OS service tools to delete a dump" on page 719

Learn how to delete a dump using the i5/OS service tools.

Using an HMC to delete a dump

Learn how to use an HMC to delete a dump.

Dumps are stored in the HMC's Manage Serviceable Events tool and are automatically deleted when room is required for new dumps. Use this procedure when you want to manually delete a dump.

1. In the navigation area, open **Systems Management**.

2. Select the server and open it.
3. Select **Serviceability**.
4. Select **Manage Dumps**.
5. Select **Selected > Delete Dump**.
6. Select the dump to delete.
7. Verify that HMC containing the dump is the HMC being used to delete the dump.
8. Select **Selected → Delete Dump**.

Using the AIX command line to delete a dump

Learn how to delete a dump using the AIX command line.

Platform dumps are saved in AIX under the following directory:

`/var/adm/platform`

Only delete the dump if directed to do so by your next level of support or service provider.

Note: If the AIX partition becomes the service partition after it was installed, run the following command to create this directory:

```
platform_dump -f jfs2
```

or

```
platform_dump -f jfs
```

to create the `/var/adm/ras/platform` file system.

During an installation, this directory is created automatically if the AIX partition was marked as the service partition before it was installed.

Using the Linux command line to delete a dump

Learn how to delete a dump using the Linux command line.

Platform dumps are saved in AIX under the following directory: `/var/log/dump/`

Only delete the dump if directed to do so by your next level of support or service provider.

Using the i5/OS service tools to delete a dump

Learn how to delete a dump using the i5/OS service tools.

1. On any command line, enter STRSST.
2. Enter a valid service tools user ID and password.
3. Select option 1 (Start a service tool).
4. Select option 6 (Main storage dump manager).
5. Select option 2 (Work with copies of main storage dumps).
6. If you want to delete any dump copies, type 4 next to the dump copies, and press Enter twice.
7. To exit SST, press F3 (Exit) three times, and then press Enter.

Performing an IBM i5/OS main storage dump

A main storage dump is a collection of data from the i5/OS's main storage. It can be manually initiated when the system administrator suspects a system wait or loop, or automatically by the server firmware as the result of a system failure.

Note: Before performing a main storage dump, collect any reference code information from the control panel or the HMC.

“Using the HMC to perform an IBM i5/OS main storage dump”

Learn how to use the HMC to perform an IBM i5/OS main storage dump.

“Using the control panel to perform an IBM i5/OS main storage dump”

Learn how to use the control panel to perform an IBM i5/OS main storage dump.

“Using the HMC to perform an IBM i5/OS main storage dump”

Learn how to use the HMC to perform an IBM i5/OS main storage dump.

“Using the control panel to perform an IBM i5/OS main storage dump”

Learn how to use the control panel to perform an IBM i5/OS main storage dump.

Using the HMC to perform an IBM i5/OS main storage dump

Learn how to use the HMC to perform an IBM i5/OS main storage dump.

Note: Before performing a or main storage dump, collect any reference code information from the control panel or the HMC.

Follow these steps to perform a main storage dump from an HMC:

Note: If a main storage dump occurred automatically, go to “Managing dumps” on page 710 for information on how to copy, report, or delete a dump.

1. In the navigation area, open **Server and Partition**.
2. Select **Server Management**.
3. In the contents area, expand Partitions.
4. Right-click the logical partition and select **Restart Partition**.
5. Select **Dump**.
6. Click **OK**.
7. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 710.

Using the control panel to perform an IBM i5/OS main storage dump

Learn how to use the control panel to perform an IBM i5/OS main storage dump.

Note: Before performing a or main storage dump, collect any reference code information from the control panel or the HMC.

If you do not have an HMC, follow these steps to perform a platform system dump:

1. Verify that no interactive jobs are running.
2. On the control panel, select Manual mode.
3. Use the increment or decrement buttons to select function 22 (main storage dump).
4. Press Enter on the control panel.
5. Is 00000000 or FF displayed on the control panel for more than 30 seconds?
 - **Yes:** The service processor or server firmware is not responding to a request from the control panel. Contact your next level of support or your hardware service provider. **This ends the procedure.**

- **No:** An attention SRC A1xx 3022 is displayed, which indicates that function 22 has been selected. Continue with the next step.
6. Perform the following steps on the control panel:
 - a. Reselect function 22.
 - b. Press Enter.
 - c. Switch back to Normal mode and wait for the dump to complete. If function 22 was selected, the appearance of an A2D0 3000 on the console indicates that a successful user-initiated main storage dump was performed. (A B6xx xxxx reference code indicates that a successful i5/OS initiated main storage dump was performed.)
 7. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 710.

Performing a slow boot

Learn how to perform a slow boot using the HMC, control panel, or ASMI menus depending on your configuration.

In some cases, you need to perform a slow-mode boot in order to perform extended diagnostic testing.

Note: A slow-mode boot might yield a new reference code on the control panel, or new errors in the service processor error log. When the server reports a new error code, record it for use in subsequent steps.

“Using the HMC to perform a slow boot”

Learn how to perform a slow boot using the HMC.

“Using the control panel to perform a slow boot”

Learn how to use the control panel to perform a slow boot.

“Using the ASMI menus to perform a slow boot” on page 723

Learn how to use the ASMI menus to perform a slow boot.

Using the HMC to perform a slow boot

Learn how to perform a slow boot using the HMC.

In some cases, you need to perform a slow-mode boot in order to perform extended diagnostic testing.

Note: A slow-mode boot might yield a new reference code on the control panel, or new errors in the service processor error log. When the server reports a new error code, record it for use in subsequent steps.

1. Record any reference codes appearing on the control panel or HMC.
2. Shut down all logical partitions and the server.
3. In the navigation area, open **Systems Management**.
4. Open **Servers**.
5. Select the server you want to perform a slow boot on.
6. In the **Tasks** area, select **Properties**.
7. Click the **Power-On Parameters** tab.
8. Record the current boot setting in the Current column next to the Power-on speed override box.
9. Select **slow** from the list in the Power-on speed override box in the Next column.

Note: These settings will apply to all future boots. After you complete the service action, change the settings back to what you recorded in step 8.

10. Click **OK**.
11. After you are done, return to the step in the procedure that caused you to perform a slow boot. **This ends the procedure.**

Using the control panel to perform a slow boot

Learn how to use the control panel to perform a slow boot.

In some cases, you need to perform a slow-mode boot in order to perform extended diagnostic testing.

Note: A slow-mode boot might yield a new reference code on the control panel, or new errors in the service processor error log. When the server reports a new error code, record it for use in subsequent steps.

1. Record any reference codes appearing on the control panel.
2. Stop the operating system by performing the following steps:

- a. Log in to the system as a user with the authority to run the shutdown or pwrdownsys (Power Down System) command.
- b. At the command line, enter one of the following commands:

Note: These commands stop the operating system. The system power turns off, the power-on light begins to slowly blink, and the system goes into a standby state.

- If your system is running AIX, type shutdown
 - If your system is running IBM i5/OS, type pwrdownsys *immed
 - If your system is running Linux, type shutdown -h now
3. On the control panel, use the increment or decrement buttons to scroll to function 02.
 4. Press Enter to start function 02. The current IPL type (with pointer) and speed is displayed.
 5. Use the increment or decrement buttons to scroll through the IPL types and speeds.
 6. When manual is shown, press Enter to select the IPL type of manual. The current IPL type and speed (with pointer) is displayed.
 7. Use the increment or decrement buttons to scroll through the IPL speeds.
 8. When S is shown, press Enter to select the IPL speed of slow.
 9. To exit function 02, press Enter multiple times until just 02 is displayed.
 10. Power on the server by pressing the white power button. Then return to the procedure that caused you to perform a slow boot. **This ends the procedure.**

Using the ASMI menus to perform a slow boot

Learn how to use the ASMI menus to perform a slow boot.

In some cases, you need to perform a slow-mode boot in order to perform extended diagnostic testing.

Note: A slow-mode boot might yield a new reference code on the control panel, or new errors in the service processor error log. When the server reports a new error code, record it for use in subsequent steps.

1. Record any reference codes appearing on the control panel or HMC.
2. Shut down all logical partitions and the server.
3. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
4. Expand **Power/Restart Control** and select **Power On/Off System**.
5. Record the settings so that you can re-enter them after you complete the service actions.
6. On the Power on/off system menu, select the following:
 - Select **Slow** in the Set System Boot Speed field.
 - Select **Running** in the Boot to system server firmware field.
7. Select **Save Settings**.

Note: These settings will apply to all future boots. After you complete the service action, change the settings back to what you recorded in step 5.

8. After you are done, return to the step in the procedure that caused you to perform a slow boot. **This ends the procedure.**

Determining the primary or alternate console

Use this procedure to determine the primary or alternate console.

If the HMC has been configured as the primary console, the system will start the HMC.

If the Operations Console has been configured as the primary console, the system will start the Operations Console. If the Operations Console has not been configured, the primary console is a workstation that is attached to the first input/output processor (IOP) that is capable of supporting workstations.

In addition to the primary console, the system can assign up to two alternative consoles. The first alternative console can only be a twinax workstation that is attached to the same IOP as the primary console. The second alternative console is a workstation that is attached to the next IOP or input/output adapter (IOA) that is capable of supporting workstations.

The IOP that supports the console must be on the first system bus (bus 1).

If a workstation is not correctly attached to the first IOP that is capable of attaching workstations, then the system will not assign a primary console. The system will display a reference code on the operator's panel. In addition, if the IPL (initial program load) mode is set to Manual, the system will stop.

“Primary console workstation requirements”

Learn about the primary console workstation requirements.

“Find the primary console when the system is operational” on page 725

Learn how to find the primary console when the system is operational.

“Find the primary console when the system power is off” on page 725

Learn how to find the primary console when the system power is off.

Primary console workstation requirements

Learn about the primary console workstation requirements.

In order to be the primary console, the workstation must be operational and have the correct port and address. If the workstation is a PC, it must also have an active emulation program on the workstation.

The workstation requirements are:

- HMC
- twinax workstation - Port 0 Address 0
- ASCII workstation - Port 0
- PC attached to ASCII IOP or IOA
 - Port 0
 - PC software to emulate a 316x or 3151 terminal
- PC attached to twinax IOP
 - Port 0 Address 0
 - 5250 emulator software active on PC
- PC attached to a LocalTalk IOA (6054)
 - SNAps 5250 Version 1.2 (or above) application
 - Console capable selected on Macintosh (IOA converts to Port 0 Address 0)
- PC attached to a 2609, 2612, 2699, or 2721 communications IOA
 - Client Access Console cable attached to the 2609 or 2612 P2 port (part number 46G0450 or 46G0479), 2699 (part number 21H3779), or 2721 (part number 44H7504)
 - Operations Console cable attached to the 2609 or 2612 (part number 97H7555), 2699 (part number 97H7556), or 2721 (part number 97H7557) - 5250 emulation or Rumba active on PC

Find the primary console when the system is operational

Learn how to find the primary console when the system is operational.

The following methods are available to find the primary console:

- **Method 1:** Look for a sign-on display with a DSP01 in the upper-right corner.
- **Method 2:** If the device name (DSP01) for the console has been changed, you can verify the device name for the primary console by doing the following:
 1. Enter DSPCTLD QCTL on any command line. The Display Controller Description display is displayed.
 2. Find the Resource name parameter (such as CTL01) and record it.
 3. Enter PRTDEVADR rrrr on any command line, where rrrr is the resource name you recorded.

Note: If the printer is active, the data will print.

- **Method 3:**
 1. Enter STRSST on any command line. The System Service Tools display is displayed.
 2. Select option 1 (Start a service tool).
 3. Select option 7 (Hardware service manager).
 4. Select option 2 (Logical hardware resources).
 5. Select option 1 (System bus resources). On the Logical Hardware Resources on System Bus display, the "<" symbol indicates the IOP that the console is attached to.
 6. Use option 9 (Resource associate with IOP and display detail) to find the location of the system bus, board, and card.

Find the primary console when the system power is off

Learn how to find the primary console when the system power is off.

Use one of the following:

- Turn on the system in Manual mode and look for the IPL and Install System display.
- Turn on the system in Normal mode and look for DSP01 on the sign on display.

Note that the name might have been changed. See "Find the primary console when the system is operational" to determine the display name.

Resetting the service processor

Use this procedure to reset the service processor.

Note: Use this procedure *only* under the direction of your next level of support or your hardware service provider. During this procedure you will be powering off the system and removing and reapplying AC power.

1. Inform anyone using the server that it will be shut down.
2. Stop all applications that are running on the server.
3. Stop the operating system and server by choosing from the following options:
 - If you have an HMC, shut down all logical partitions and the server. For instructions see “Powering on and powering off” on page 641. Then continue with step 6.
 - If you do *not* have an HMC, continue with the next step.
4. Log in to the system as a user with the authority to run the appropriate shutdown command.
5. At the command line, enter one of the following commands:
 - If your system is running AIX, type `shutdown`
 - If your system is running i5/OS, type `PWRDWSYS *IMMED`
 - If your system is running Linux, type `shutdown -h now`

These commands stop the operating system. The system power turns off, the power-on light begins to slowly blink, and the system goes into a standby state.

6. Unplug the AC power cord and replug it back in.
7. Start the server. The service processor is reset. **This ends the procedure.**

Resetting the managed system connection from the HMC

Use this procedure to reset the managed system connection from the HMC.

Perform these steps to reset the managed system connection:

1. In the navigation area, open **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to reset the connection.
4. In the **Tasks** area, open **Connections**.
5. Select **Reset or Remove Connection**.
6. Select **Reset Connection**.
7. Click **OK**.

Checking for a duplicate IP address

Use this procedure to check for a duplicate IP address.

Perform these steps to check for a duplicate IP address.

1. On the HMC, right-click the desktop and select **terminal** → **rshterm**.
2. At the terminal, issue this command: `lssyscfg -r sys -F "name,ipaddr"` A list of managed systems' names and their IP address (or host name) will be displayed.
3. Check to see if there are duplicates.

Running the online and eServer stand-alone diagnostics

Use these tools to diagnose hardware problems on your AIX or Linux systems or partitions.

Use these diagnostics only if you are directed to do so by your next level of support or your hardware service provider.

Diagnostics are available for AIX and Linux systems or logical partitions which can help you perform hardware analysis. Additionally, there are various service aids in AIX diagnostics that can help you with service tasks on the system or logical partition. If there is a problem, you will receive a Service Request Number (SRN) that can help you pinpoint the problem and determine a corrective action.

If you have AIX installed and it is running, you can perform online diagnostics. However, if the installed AIX cannot be started, or you have Linux installed, you will need to run the diagnostics from CD or from a NIM server.

Verifying the repair can also be done using the diagnostics CD. To verify a repair in Linux, see *Verify the repair in Linux*. To verify the repair in AIX, see *Verify the repair in AIX*.

“Running the online diagnostics”

If you have AIX installed and it can be started, use this procedure to perform diagnostic procedures when directed from another procedure or by your next level of support.

“Running the eServer stand-alone diagnostics from CD-ROM” on page 732

If the system or logical partition where you would like to run diagnostics has AIX installed but it cannot be started, or you have Linux installed, use this procedure to perform diagnostic procedures from CD-ROM when directed from another procedure or by your next level of support.

“Running the eServer stand-alone diagnostics from a Network Installation Management server” on page 736

If the system or logical partition where you would like to run diagnostics has AIX installed but it cannot be started, or you have Linux installed, use this procedure to perform diagnostic procedures from a Network Installation Management (NIM) server when directed from another procedure or by your next level of support.

Running the online diagnostics

If you have AIX installed and it can be started, use this procedure to perform diagnostic procedures when directed from another procedure or by your next level of support.

When you run online diagnostics, keep the following in mind:

- When AIX is installed, the support for some devices might not be automatically installed. If this happens, that device will not display in the test list when online diagnostics run.
- When running diagnostics in a logically partitioned system, you must run diagnostics in the logical partition containing the resource or resources that you want to test.

Three modes are available for running the online diagnostics:

- **Service mode** provides the most complete check of the system resources, but requires that no other programs are running on the system. When possible, run the diagnostics in service mode.
- **Maintenance mode** allows you to check most of the available resources, with the exception of SCSI adapters, memory, processor, and the disk drive used for paging.
- **Concurrent mode** allows you to run online diagnostics on some of the system resources while the system is running normal activity.

“Running the online diagnostics in service mode” on page 730

Use this procedure to run the online diagnostics in service mode.

“Running the online diagnostics in maintenance mode” on page 731

Use this procedure to run the online diagnostics in maintenance mode.

“Running the online diagnostics in concurrent mode” on page 731
Use this procedure to run the online diagnostics in concurrent mode.

Running the online diagnostics in service mode

Use this procedure to run the online diagnostics in service mode.

Using service mode will check everything except the SCSI adapter and the disk drives used for paging. However, memory and processor are only tested during POST. Running in service mode ensures that the error state of the system that has been captured in NVRAM is available for your use in analyzing the problem.

“Running the online diagnostics in service mode with an HMC attached”

Use this procedure to run the online diagnostics in service mode with an HMC attached.

“Running the online diagnostics in service mode without an HMC attached”

Use this procedure to run the online diagnostics in service mode *without* an HMC attached.

Running the online diagnostics in service mode with an HMC attached:

Use this procedure to run the online diagnostics in service mode with an HMC attached.

Perform the following steps:

1. Stop all programs including the AIX operating system. For details, see Start or stop the system.
2. From the HMC, right-click **Partition Manager** and select **Open Terminal Window**.
3. From the Service Processor Menu on the VTERM, select option 2 (System Power Control).
4. Select option 6.
5. Verify that the state changes to currently disabled. Disabling fast system boot automatically enables slow boot.
6. Select option 98 to exit the system power control menu.
7. From the HMC, start the managed system in a full system partition by following these steps:
 - a. In the Contents area, select the managed system.
 - b. Right-click, and select **Power On**.
8. Select **Power on Diagnostic Stored Boot list**.
9. Make sure that there is no media in the devices in the media subsystem.
10. Enter any passwords, if requested.
11. When the Diagnostic Operating Instructions screen displays, follow the online instructions to check the desired resources.

Note: If you do not receive the Diagnostic Operating Instructions display, try to run the standalone diagnostics. For details, see “Running the eServer stand-alone diagnostics from CD-ROM” on page 732.

12. When finished, contact your next level of support or your hardware service provider with any information you received during the diagnostics, including service request numbers (SRNs).

Running the online diagnostics in service mode without an HMC attached:

Use this procedure to run the online diagnostics in service mode *without* an HMC attached.

Perform the following steps:

1. Stop all programs including the AIX operating system. For details, see Start or stop the system.
2. Remove all tapes, diskettes, and CDs.
3. Turn off the system unit power.
4. Turn on the system unit power.

5. After the keyboard POST indicator displays on the firmware console, and before the last POST indicator (speaker) displays, press 6 on the keyboard or ASCII terminal to indicate that a service mode boot should be initiated using the customized service mode boot list.
6. Enter any passwords, if requested.
7. When the Diagnostic Operating Instructions screen displays, follow the online instructions to check the desired resources.

Note: If you do not receive the Diagnostic Operating Instructions display, try to run the standalone diagnostics. For details, see “Running the eServer stand-alone diagnostics from CD-ROM” on page 732.

8. When finished, contact your next level of support or your hardware service provider with any information you received during the diagnostics, including service request numbers (SRNs).

Running the online diagnostics in maintenance mode

Use this procedure to run the online diagnostics in maintenance mode.

Maintenance mode requires that all activity on the logical partition running the AIX operating system be stopped so that the online diagnostics have most of the resources available. All of the system resources, except the SCSI adapters, memory, processor, and the disk drive used for paging can be checked.

Perform the following steps to run the online diagnostics in maintenance mode:

1. Stop all programs running on the logical partition except the AIX operating system.
2. Log in to the AIX operating system as root user or use CE login.
3. Type the shutdown -m command to stop all activity on the AIX operating system and put it into maintenance mode.
4. When a message indicates that the system is in maintenance mode, enter the diag command to invoke the diagnostic controller so you can run the diagnostics.

Note: It might be necessary to set TERM type again.

5. Enter any passwords, if requested.
6. When the Diagnostic Operating Instructions screen displays, follow the online instructions to check the desired resources.

Note: If you do not receive the Diagnostic Operating Instructions display, try to run the standalone diagnostics. For details, see “Running the eServer stand-alone diagnostics from CD-ROM” on page 732.

7. When finished, press Ctrl+D to log off from root user or CE login.
8. Contact your next level of support or your hardware service provider with any information you received during the diagnostics, including service request numbers (SRNs). **This ends the procedure.**

Running the online diagnostics in concurrent mode

Use this procedure to run the online diagnostics in concurrent mode.

Use concurrent mode to run online diagnostics on some of the system resources while the system is running normal activity.

Because the system is running in normal operation, the following resources cannot be tested in concurrent mode:

- SCSI adapters connected to paging devices
- Disk drive used for paging
- Some display adapters and graphics related devices

The following levels of testing exist in concurrent mode:

Share-test level

This level tests a resource while the resource is being shared by programs running in the normal operation. This testing is mostly limited to normal commands that test for the presence of a device or adapter.

Sub-test level

This level tests a portion of a resource while the remaining part of the resource is being used in normal operation. For example, you could test one port of a multiport device while the other ports are being used in normal operation.

Full-test level

This level requires the device to not be assigned or used by any other operation. This level of testing on a disk drive might require the use of the vary off command. Use the diagnostics display menus to allow you to vary off the needed resource.

Perform the following steps to run online diagnostics in concurrent mode:

1. Log in to the AIX operating system as root user, or use CE login. If you need help, contact the system administrator.
2. Enter the diag command to load the diagnostic controller, and display the online diagnostic menus.
3. If requested, enter a password.
4. When the Diagnostic Operating Instructions screen displays, follow the online instructions to check the desired resources.

Note: If you do not receive the Diagnostic Operating Instructions display, try to run the standalone diagnostics. For details, see “Running the eServer stand-alone diagnostics from CD-ROM.”

5. When testing is complete, press F3 to return to the Diagnostic Operating Instructions display.
6. Press F3 again to return to the AIX operating system prompt.
7. Vary on any resources that you varied off.
8. Press Ctrl+D to log off from root user or CE login.
9. When finished, contact your next level of support or your hardware service provider with any information you received during the diagnostics, including service request numbers (SRNs).

Running the eServer stand-alone diagnostics from CD-ROM

If the system or logical partition where you would like to run diagnostics has AIX installed but it cannot be started, or you have Linux installed, use this procedure to perform diagnostic procedures from CD-ROM when directed from another procedure or by your next level of support.

Diagnostics, which are available for AIX and Linux systems and logical partitions, can help you perform hardware analysis. If a problem is found, you will receive a service request number (SRN) or a service reference code (SRC) that can help pinpoint the problem and determine a corrective action.

Additionally, there are various service aids in the diagnostics that can help you with service tasks on the system or logical partition.

“Running the eServer stand-alone diagnostics from CD on a server with an HMC attached” on page 733

Learn how to run the eServer stand-alone diagnostics on a system with an HMC attached.

“Running the eServer stand-alone diagnostics from CD on a server without an HMC attached” on page 734

Learn how to run the eServer stand-alone diagnostics on a system without an HMC attached.

Running the eServer stand-alone diagnostics from CD on a server with an HMC attached

Learn how to run the eServer stand-alone diagnostics on a system with an HMC attached.

If you have logical partitions, note the following considerations:

- When running diagnostics in a logically partitioned system, you must run diagnostics in the logical partition containing the resource or resources that you want to test.
- The device from which you are loading stand-alone diagnostics must be made available to the logical partition on which you want to run diagnostics. This might require moving the device (for example, the CD drive or network adapter connected to the Network Installation Management (NIM) server that has a stand-alone diagnostic image) from the logical partition that currently contains the device to the logical partition on which you want to run diagnostics.

Perform the following steps from the HMC to run stand-alone diagnostics:

Note: If you need help with any of these steps, contact your system operator.

1. Remove all tapes, diskettes, CDs, or DVDs, and insert the diagnostic CD into the CD drive on the managed system (not the CD drive on the HMC).
2. Shut down the operating system from the HMC by performing the following steps:
 - a. In the navigation area, select **Server and partition** → **Server Management**.
 - b. In the contents pane, expand the server that contains the partition you want to test.
 - c. Right-click the partition and select **Open Terminal Window**.
 - d. In the VTerm window, log in as root user and enter any requested passwords.
 - e. Shut down the operating system using one of the following commands:
 - If AIX is running, type the shutdown -F command.
 - If Linux is running, type the shutdown -h now command
 - f. Close the VTerm window.
3. From the HMC, right-click the partition and select **Activate**.
4. Ensure the **Open a terminal window or console session box** is selected and click **OK**.
5. When the keyboard POST indicator (the word *keyboard*) is shown on the firmware console, and before the last POST indicator (the word *speaker*) is shown, press the 5 key on either the attached keyboard or the ASCII keyboard to indicate that a service mode boot should be initiated using the default service mode boot list.
6. Continue with “Selecting testing options.”

Selecting testing options:

1. When the keyboard POST indicator (the word *keyboard*) is shown on the firmware console, and before the last POST indicator (the word *speaker*) is shown, press the 5 key on either the attached keyboard or the ASCII keyboard to indicate that a service mode boot should be initiated using the default service mode boot list.
2. When the Welcome screen is shown, define the following:
 - System console
 - Language to be used
 - Type of terminal

Note: Depending on the terminal emulator selected, the function keys (Fn) might not function. In this case, use the ESC and the number in the screen menus. For example, F3 = ESC key and the #3.

3. When the Diagnostics Operating Instructions appear, press Enter.

Note: If you are unable to load the diagnostics to the point where the "Diagnostic Operating Instructions" display is shown, contact your next level of support or your hardware service provider.

4. From the Function Select screen, select one of the following:
 - If you want to run diagnostics in Problem Determination mode, continue with the next step.
 - If you want to run diagnostics in Task Selection (Service Aids) mode, go to step 11.
5. Select **Problem determination** and press Enter.
6. Check the list of resources that is displayed. Does the list of resources match what you know to be installed in your system or partition?
 - **Yes:** Continue with the next step.
 - **No:** Record any information you have about the missing resource and check to ensure that the missing resource is installed correctly. If you cannot correct the problem with a missing resource, replace the missing resource (contact your service provider if necessary). To test the available resources, continue with the next step.
7. Select **All Resources**, or the specific resource or resources to be tested, and press the P7 (commit) key.
8. Record any error information you receive during the diagnostics, including service request numbers (SRNs) or SRCs, to report to your service provider.
9. When testing is complete, press the F3 key to return to the Diagnostic Operating Instructions.
10. Choose from the following options:
 - To continue testing, return to step 7.
 - To exit stand-alone diagnostics, select the exit function key from the menu and press Enter. Continue with step 18.
11. Select **Task Selection list** and press Enter.
12. To perform one of these tasks, select the **Task Selection** option from the Function Selection menu. After a task is selected, a resource menu might be presented showing all resources supported by the task.
13. From the Task selection list, select the service aid task you want to perform. For example, Update and manage system Flash.
14. Follow the instructions for the task selected on each menu or panel.
15. Record any information you receive during the diagnostics, including service request numbers (SRNs), to report to your service provider.
16. When testing is complete, press the F3 key to return to the Diagnostic Operating Instructions.
17. Choose from the following options:
 - To continue testing, return to step 13.
 - To exit stand-alone diagnostics, select the exit function key from the menu and press Enter. Continue with the next step.
18. Remove the CD from the drive.
19. When finished, contact your next level of support or your hardware service provider with any information you received during the diagnostics, including service request numbers (SRNs) and any missing resources. **This ends the procedure.**

Running the eServer stand-alone diagnostics from CD on a server without an HMC attached

Learn how to run the eServer stand-alone diagnostics on a system without an HMC attached.

1. Choose from the following options:
 - If the system is powered on, continue with step 2.
 - If the system is powered off, continue with step 3 on page 735.
2. If the system is powered on, perform these steps:

- a. Let the system administrator and system users know that the system unit will be shut down.
- b. Stop all programs including the operating system. For details, see “Powering on and powering off” on page 641.
- c. Continue with step 4.
3. If the system is powered off, perform the following steps:
 - a. Start the server so you will be able to insert the diagnostic CD into the CD drive during the next step.
 - b. Continue with step 4.
4. Insert the diagnostic CD in the CD drive.
5. Re-start the server.
6. Continue with “Selecting testing options.”

Selecting testing options:

1. When the keyboard POST indicator (the word *keyboard*) is shown on the firmware console, and before the last POST indicator (the word *speaker*) is shown, press the 5 key on either the attached keyboard or the ASCII keyboard to indicate that a service mode boot should be initiated using the default service mode boot list.
2. When the Welcome screen is shown, define the following:
 - System console
 - Language to be used
 - Type of terminal

Note: Depending on the terminal emulator selected, the function keys (Fn) might not function. In this case, use the ESC and the number in the screen menus. For example, F3 = ESC key and the #3.
3. When the Diagnostics Operating Instructions appear, press Enter.

Note: If you are unable to load the diagnostics to the point where the “Diagnostic Operating Instructions” display is shown, contact your next level of support or your hardware service provider.
4. From the Function Select screen, select one of the following:
 - If you want to run diagnostics in Problem Determination mode, continue with the next step.
 - If you want to run diagnostics in Task Selection (Service Aids) mode, go to step 11 on page 736.
5. Select **Problem determination** and press Enter.
6. Check the list of resources that is displayed. Does the list of resources match what you know to be installed in your system or partition?
 - **Yes:** Continue with the next step.
 - **No:** Record any information you have about the missing resource and check to ensure that the missing resource is installed correctly. If you cannot correct the problem with a missing resource, replace the missing resource (contact your service provider if necessary). To test the available resources, continue with the next step.
7. Select **All Resources**, or the specific resource or resources to be tested, and press the P7 (commit) key.
8. Record any error information you receive during the diagnostics, including service request numbers (SRNs) or SRCs, to report to your service provider.
9. When testing is complete, press the F3 key to return to the Diagnostic Operating Instructions.
10. Choose from the following options:
 - To continue testing, return to step 7.

- To exit stand-alone diagnostics, select the exit function key from the menu and press Enter.
Continue with step 18.
11. Select **Task Selection list** and press Enter.
 12. To perform one of these tasks, select the **Task Selection** option from the Function Selection menu. After a task is selected, a resource menu might be presented showing all resources supported by the task.
 13. From the Task selection list, select the service aid task you want to perform. For example, Update and manage system Flash.
 14. Follow the instructions for the task selected on each menu or panel.
 15. Record any information you receive during the diagnostics, including service request numbers (SRNs), to report to your service provider.
 16. When testing is complete, press the F3 key to return to the Diagnostic Operating Instructions.
 17. Choose from the following options:
 - To continue testing, return to step 13.
 - To exit stand-alone diagnostics, select the exit function key from the menu and press Enter.
Continue with the next step.
 18. Remove the CD from the drive.
 19. When finished, contact your next level of support or your hardware service provider with any information you received during the diagnostics, including service request numbers (SRNs) and any missing resources. **This ends the procedure.**

Running the eServer stand-alone diagnostics from a Network Installation Management server

If the system or logical partition where you would like to run diagnostics has AIX installed but it cannot be started, or you have Linux installed, use this procedure to perform diagnostic procedures from a Network Installation Management (NIM) server when directed from another procedure or by your next level of support.

Diagnostics, which are available for AIX and Linux systems and logical partitions, can help you perform hardware analysis. If a problem is found, you will receive a service request number (SRN) that can help pinpoint the problem and determine a corrective action.

A client system connected to a network with a NIM server can boot stand-alone diagnostics from the NIM server if the client-specific settings on both the NIM server and client are correctly configured.

Note:

1. For NIM clients that have adapters that would normally require that supplemental media be installed when stand-alone diagnostics are run from CD, the support code for these adapters must be installed into the directory pointed to by the NIM SPOT from which you wish to boot that client. Before running stand-alone diagnostics on these clients from the NIM server, the NIM server system administrator must ensure that any needed support for these devices is installed on the server.
2. All operations to configure the NIM server require root user authority.
3. If you replace the network adapter in the client, the network adapter hardware address settings for the client must be updated on the NIM server.
4. The **Cstate** for each stand-alone diagnostics client on the NIM server should be kept in the *diagnostic boot has been enabled* state.
5. On the client system, the NIM server network adapter should be put in the bootlist after the boot disk drive. This allows the system to boot in stand-alone diagnostics from the NIM server if there is a problem booting from the disk drive. Refer to the Multiboot section under "SMS" in the client system's service guide for information on setting the bootlist.

Configuring the NIM server

Refer to the "Advanced NIM configuration tasks" chapter of the AIX Installation Guide and Reference for information on performing the following tasks:

- Registering a client on the NIM server
- Enabling a client to run diagnostics from the NIM server

To verify that the client system is registered on the NIM server and the diagnostic boot is enabled, run the command from the command line on the NIM server: `lsnim -a Cstate -z ClientName`. Refer to the following table for system responses.

Note: The ClientName is the name of the system on which you want to run stand-alone diagnostics.

System response	Client status
#name:Cstate:ClientName:diagnostic boot has been enabled:	The client system is registered on the NIM server and enabled to run diagnostics from the NIM server.
#name:Cstate:ClientName:ready for a NIM operation:or #name:Cstate:ClientName:BOs installation has been enabled:	The client is registered on the NIM server but not enabled to run diagnostics from the NIM server. Note: If the client system is registered on the NIM server but Cstate has not been set, no data will be returned.
0042–053 lsnim: there is no NIM object named "ClientName"	The client is not registered on the NIM server.

Configuring the client and running the stand-alone diagnostics from a NIM server

Perform the following steps to run stand-alone diagnostics on a client from the NIM server:

1. Let the system administrator and system users know that the system unit might be shut down.
2. Stop all programs including the AIX or Linux operating system. For details, see Start or stop the system. If you need help, contact the system administrator.
3. Remove all tapes, diskettes, and CDs.
4. Choose from the following options:
 - If you are running stand-alone diagnostics in a full system partition profile, verify with the system administrator and system users that the system unit can shut down using the shutdown command. Then power down the system.
 - If you are running on a logically partitioned system, make sure the CD drive is available to the partition used to run stand-alone diagnostics. Verify with the system administrator and system users using that partition that all applications on that partition must be stopped, and that the partition will be restarted. Stop all programs on that partition, including the operating system.
5. Choose from the following options:
 - If you are in a full system partition, power on the system unit to run stand-alone diagnostics.
 - If you are in a logically partitioned system, restart the partition to run stand-alone diagnostics.
6. When the keyboard indicator is displayed (the word *keyboard* on an HMC virtual terminal window or the keyboard icon on a graphical display) press the number 1 key on the keyboard to display the SMS menu.
7. Enter any requested passwords.
8. Select **Set Up Remote IPL** (Initial Program Load).
9. Enter the client address, server address, gateway address, if applicable, and subnet mask. If there is no gateway between the NIM server and the client, set the gateway address to 0.0.0.0.
To determine if there is a gateway, either ask the system network administrator or compare the first three octets of the NIM server address and the client address. If they are the same, (for example, if

the NIM server address is 9.3.126.16 and the client address is 9.3.126.42, the first 3 octets (9.3.126) are the same), then set the gateway address in the RIPL field to 0.0.0.0.

Note: The RIPL is located under the Utility menu in System Management Services (SMS). Refer to it for information on setting these parameters.

10. If the NIM server is set up to allow pinging from the client system, use the ping utility in the RIPL utility to verify that the client system can ping the NIM server.
11. Under the ping utility, choose the network adapter that provides the attachment to the NIM server to do the ping operation. If the ping returns with an OK prompt, the client is prepared to boot from the NIM server. If ping returns with a FAILED prompt, the client cannot proceed with the NIM boot.

Note: If the ping fails, refer to the Boot problems and concerns information. Then follow the steps for network boot problems.

12. Exit the SMS Main screen.
13. Select **Select Boot Options** → **Install or Boot a Device** → **Network**.
14. Record the current bootlist settings. You will need to set the bootlist back to the original settings after running diagnostics from the NIM server.
15. Change the bootlist so the network adapter attached to the NIM is first in the bootlist.
16. Set the network parameters for the adapter from which you want to boot.
17. Exit completely from SMS. The system will start loading packets while doing a bootp from the network.
18. Follow the on-screen instructions.
 - If Diagnostic Operating Instructions Version x.x.x displays, stand-alone diagnostics have installed successfully.
 - If the AIX login prompt displays, stand-alone diagnostics did not load. Continue with step 19.
19. If the diagnostics did not load, check the following items:
 - The bootlist on the client might be incorrect.
 - Cstate on the NIM server might be incorrect.
 - Network problems might be preventing you from connecting to the NIM server.
 - Verify the settings and the status of the network. If you continue to have problems, refer to the Boot problems/concerns section for the system unit. Then follow the steps for network boot problems.
20. After running diagnostics, restart the system and use SMS to change the IP settings and bootlist sequence back to the original settings.

Performing an IBM i5/OS main storage dump

A main storage dump is a collection of data from the i5/OS's main storage. It can be manually initiated when the system administrator suspects a system wait or loop, or automatically by the server firmware as the result of a system failure.

Note: Before performing a main storage dump, collect any reference code information from the control panel or the HMC.

“Using the HMC to perform an IBM i5/OS main storage dump” on page 720

Learn how to use the HMC to perform an IBM i5/OS main storage dump.

“Using the control panel to perform an IBM i5/OS main storage dump” on page 720

Learn how to use the control panel to perform an IBM i5/OS main storage dump.

“Using the HMC to perform an IBM i5/OS main storage dump” on page 720

Learn how to use the HMC to perform an IBM i5/OS main storage dump.

“Using the control panel to perform an IBM i5/OS main storage dump” on page 720

Learn how to use the control panel to perform an IBM i5/OS main storage dump.

Using the HMC to perform an IBM i5/OS main storage dump

Learn how to use the HMC to perform an IBM i5/OS main storage dump.

Note: Before performing a or main storage dump, collect any reference code information from the control panel or the HMC.

Follow these steps to perform a main storage dump from an HMC:

Note: If a main storage dump occurred automatically, go to “Managing dumps” on page 710 for information on how to copy, report, or delete a dump.

1. In the navigation area, open **Server and Partition**.
2. Select **Server Management**.
3. In the contents area, expand Partitions.
4. Right-click the logical partition and select **Restart Partition**.
5. Select **Dump**.
6. Click **OK**.
7. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 710.

Using the control panel to perform an IBM i5/OS main storage dump

Learn how to use the control panel to perform an IBM i5/OS main storage dump.

Note: Before performing a or main storage dump, collect any reference code information from the control panel or the HMC.

If you do not have an HMC, follow these steps to perform a platform system dump:

1. Verify that no interactive jobs are running.
2. On the control panel, select Manual mode.
3. Use the increment or decrement buttons to select function 22 (main storage dump).
4. Press Enter on the control panel.
5. Is 00000000 or FF displayed on the control panel for more than 30 seconds?
 - **Yes:** The service processor or server firmware is not responding to a request from the control panel. Contact your next level of support or your hardware service provider. **This ends the procedure.**

- **No:** An attention SRC A1xx 3022 is displayed, which indicates that function 22 has been selected. Continue with the next step.
6. Perform the following steps on the control panel:
 - a. Reselect function 22.
 - b. Press Enter.
 - c. Switch back to Normal mode and wait for the dump to complete. If function 22 was selected, the appearance of an A2D0 3000 on the console indicates that a successful user-initiated main storage dump was performed. (A B6xx xxxx reference code indicates that a successful i5/OS initiated main storage dump was performed.)
 7. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 710.

Chapter 8. Part Information

Assembly diagrams.

Cover assemblies

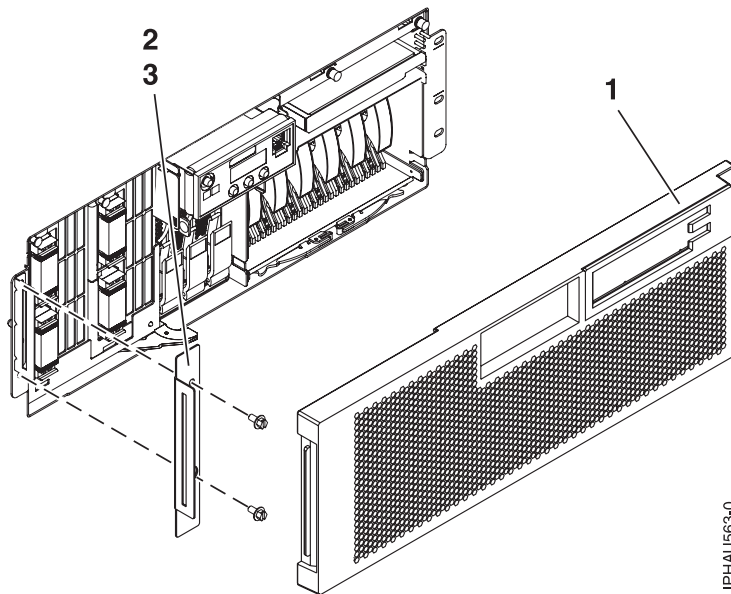
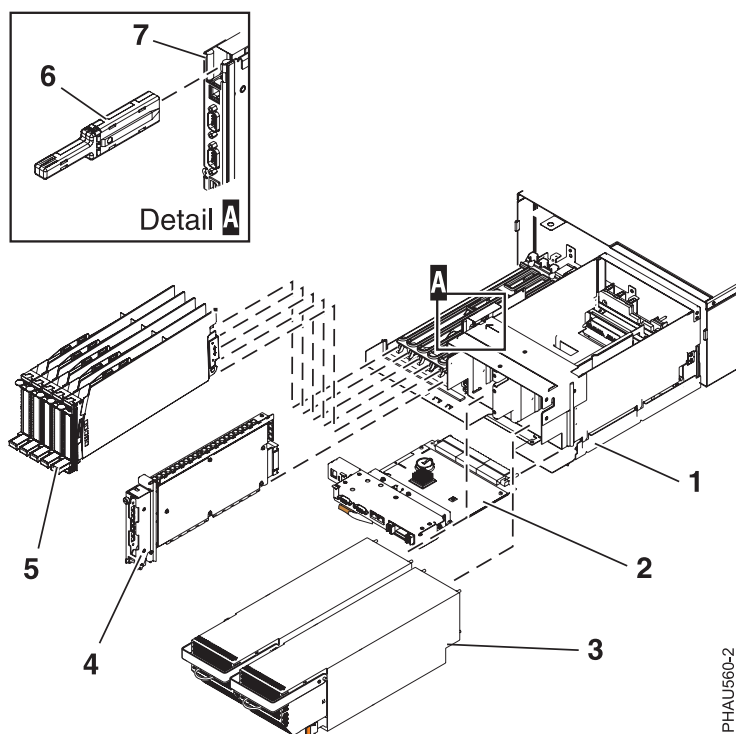


Table 65. Cover assembly part numbers

Index number	CCIN	Part number	Units per assembly	Description
1		42R6014 12K0032	1	Front cover assembly
2		42R6017	1	Front cover mounting bracket
3		04N6587	1	Front cover mounting bracket screw

Final assembly (back)



IPHAU560-2

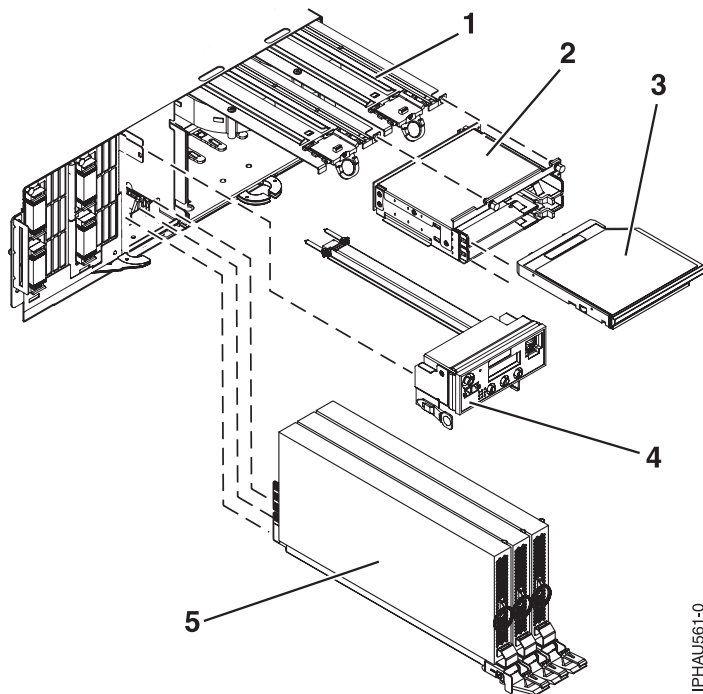
Table 66. Assembly

Index number	CCIN	Part number	Units per assembly	Description
1		04N6602	1	I/O backplane
2		16G8095 42R3965 39J5555	1	Service processor assembly Battery
3		44V3086	2	AC power supply, 1600 W
3		39J2779	2	Power supply, 1500 W
3		39J5273	2	Power supply, 840 W
3		39J2781 15R7998	2	Power supply, 835 W
3		42C2140	2	Power supply, 530 W
3		44V4294	2	Power supply, 300 W
3		22R3958	2	Power supply, 228 W
4	1800	10N9921	2	RIO/HSL card assembly
4	1802	42R6849	2	12X Channel Interface card assembly
5		42R4190	1	PCI adapter cassette, Gen 3 single wide (handle at bottom), short
5		42R4007	1	PCI adapter cassette, Gen 3 single wide (handle at bottom), long
5		16R0091	1	PCI adapter cassette, Gen 2.x (handle at top), all
5		42R4008	1	PCI adapter cassette, Gen 3 double wide (handle at bottom), long

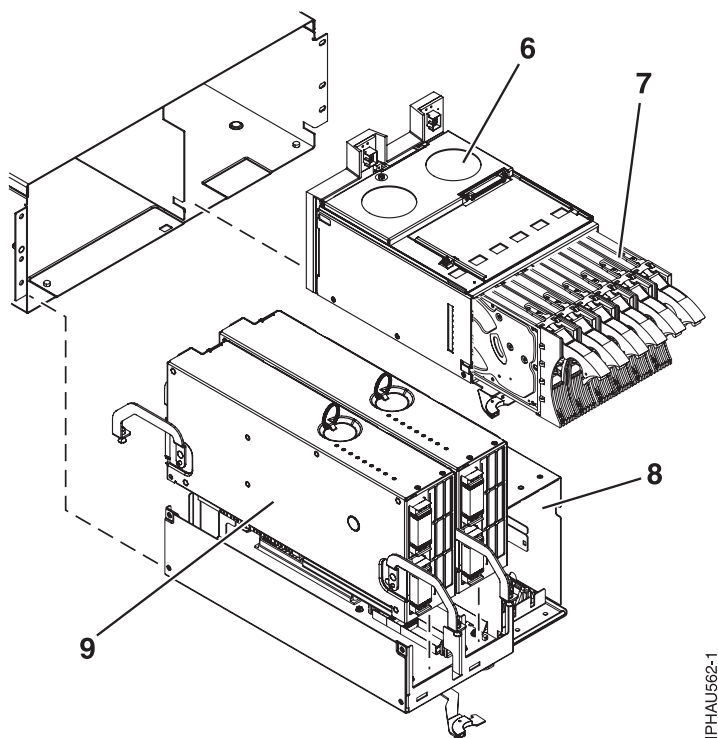
Table 66. Assembly (continued)

Index number	CCIN	Part number	Units per assembly	Description
6		10N6883	1	VPD card
7		42R6775	Feature 5636	VPD passthru card. This card provides connection for the system VPD card, system ports, and SPCN cable. 1 GB ethernet
7		42R7000	Feature 5639	VPD passthru card. This card provides connection for the system VPD card, system ports, and SPCN cable. 1 GB ethernet quad
7		07P6931	Feature 5637	VPD passthru card. This card provides connection for the system VPD card, system ports, and SPCN cable. 10 GB ethernet long range

Final assembly (front)



IPHAU561-0



IPHAU562-1

Table 67. Final assembly (front)

Index number	CCIN	Part number	Units per assembly	Description
1		39J0859 39J1176	1	Fan assembly
2	293D	10N8968	1	Removable media enclosure assembly (includes the media backplane)
3			1	Removable media
4		39J1301 10N9964 39J3084	1	Control panel assembly
5		44V2965 17G1209	3	Voltage regulator assembly

Table 68. Final assembly part numbers (continued)

Index number	CCIN	Part number	Units per assembly	Description
6		10N9617 39J1695	1	Disk drive backplane
7		39J3695 39J3698		35 GB DASD, 15 K RPM
7	433B	42R6690 39J3699 39J3696 10N7230		70 GB DASD, 15 K RPM
7		10N7200 10N7230		74 GB DASD, 15 K RPM

Table 68. Final assembly part numbers (continued) (continued)

Index number	CCIN	Part number	Units per assembly	Description
7		39J3700 39J3697		140 GB DASD, 15 K RPM
7	433C	42R6691		140 GB DASD, 15 K RPM
7		10N7232 10N7204 10N7232		146 GB DASD, 15 K RPM
7		42R6676 42R6677		282 GB DASD, 15 K RPM
7	433D	42R6692		283.7 GB DASD, 15 K RPM, 3.5"
7		10N7208 10N7208 10N7234		300 GB DASD with tray, 15 K RPM
8		03N6902	1	System processor backplane
9		10N8029		CPU book assembly, 3.5 GHz
9		10N8339		CPU book assembly, 4.2 GHz, POWER5 slots
9		10N8023		CPU book assembly, 4.2 GHz, POWER6™ slots
9		03N4468		CPU book assembly, 4.7 GHz
9	319B	15R7433		512 MG , DDR2, 667 MHz
9		77P5883		512 MG , DDR
9	319C	15R7436		1 GB , DDR2, 667 MHz
9	30F2	12R8544		1 GB DDR2
9		77P5880		1 GB , 2.5 V DDR
9	319E	15R7439		2 GB , DDR2, 667 MHz
9	30F3	16R1530		2 GB , DDR2
9	319D	15R7445		4 GB , DDR2, 553 MHz
9	319F	15R9379		8 GB , DDR2, 400 MHz, low current
9		87H3621		8 GB
9	31B4	45D1426		16 GB MIMM, DDR2, 400 MHz

Table 69. Cables

CCIN	Description	Part number
	SMP 2 drawer cable	42R8112
	SMP 3 drawer cable	42R8113
	SMP 4 drawer cable	42R8114
	FSP 2 drawer cable	42R6043
	FSP 3 drawer cable	42R6044
	FSP 4 drawer cable	42R6045
	Blower cable	03N6196
	SPCN cable assembly, base	41L5650
	SPCN 2 meter cable	22R5217
	SPCN 3 meter cable	22R5239

Table 69. Cables (continued)

CCIN	Description	Part number
	SPCN 6 meter cable	22R5219
	SPCN 15 meter cable	22R5221
	SPCN 30 meter cable	22R5222
	SPCN power to blower cable	42R4035
	Control panel cable	41L5649
	Control panel cable	42R4032
	SCSI cable, bus base	42R4034
	1 meter SCSI cable	41Y0596
	3 meter SCSI cable	41Y0597
	5 meter SCSI cable	41Y0598
	10 meter SCSI cable	41Y0599
	20 meter SCSI cable	41Y0600
	SCSI expansion cable	42R4049 42R4050
	1 meter GX Dual-Port 12X Channel Attach adapter cable	44V3422
	2 meter GX Dual-Port 12X Channel Attach adapter cable	44V3424
	3 meter GX Dual-Port 12X Channel Attach adapter cable	44V3426
	3 meter GX Dual-Port 12X Channel Attach adapter to InfiniBand 4X cable	15R8140
	10 meter GX Dual-Port 12X Channel Attach adapter to InfiniBand 4X cable	15R8141
	SAS cable	44V3435
	1 meter SAS cable	44V4041 44V4147
	3 meter SAS cable	44V4148 44V4154 44V4158 44V4163
	6 meter SAS cable	44V4149 44V4155 44V4159 44V4164
	15 meter SAS cable	44V4156 44V4160
	6 meter RIO G cable	39J2559
	10 meter RIO G cable	39J2561
	15 meter RIO G cable	21P5457

Table 70. Keyboard parts

CCIN	Description	Part number
2890-002	Keyboard, US English	89P9240
	101 key keyboard	82G3278 1392090 1394609

Table 70. Keyboard parts (continued)

CCIN	Description	Part number
	102 key keyboard problem keyboard, Arabic	8131596
	Keyboard, Arabic (ID 238)	93H8125
	Keyboard, Belgium-French (ID 120)	93H8127
	Keyboard, Belgium-Dutch	1391414
	Keyboard, Belgium-French	1391526
	Keyboard, Belgium-French (ID 120)	93H8126
	Keyboard, Brazilian Portuguese	64F7707
	Keyboard, Brazilian Portuguese (ID 275)	93H8124
	Keyboard, Bulgarian	1399583
	Keyboard, Bulgarian (ID 442)	93H8128
	Keyboard, Chinese/US (ID 467)	93H8155
	Keyboard, Czechoslovakian	1399570
	Keyboard, Czechoslovakian (ID 243)	93H8129
	Keyboard, Danish	1391407
	Keyboard, Danish (ID 159)	93H8130
	Keyboard, Dutch (ID 143)	93H8131
	Keyboard, Dutch/Netherlands	1391511
	Keyboard, Finnish/Swedish	1391411
	Keyboard, French	1391402
	Keyboard, French(ID 189)	93H8132
	Keyboard, French-Canadian	82G3279
	Keyboard, French-Canadian (ID 058) Keyboard, French-Canadian (ID 445)	93H8121 93H8122
	Keyboard, German (ID 129)	93H8133
	Keyboard, German/Austrian	1391403
	Keyboard, Greek	1399046
	Keyboard, Greek (ID 129)	93H8134
	Keyboard, Hebrew	1391408
	Keyboard, Hebrew (ID 212)	93H8135
	Keyboard, Hungarian	1399581
	Keyboard, Hungarian (ID 208)	93H8136
	102 key keyboard problem Keyboard, Icelandic	1391407
	Keyboard, Icelandic (ID 197)	93H8137
	Keyboard, Italian	1393395
	Keyboard, Italian (ID 142)	93H8138
	Keyboard, Korea (ID 413)	93H8156
	Keyboard, Latin American (Spanish)	82G3292
	Keyboard, Latvia (ID 234)	93H8152

Table 70. Keyboard parts (continued)

CCIN	Description	Part number
	Keyboard, Norwegian	1391409
	Keyboard, Norwegian (ID 155)	93H8139
	Keyboard, Portuguese	1391410
	Keyboard, Polish	1399580
	Keyboard, Polish (ID 214)	93H8140
	Keyboard, Portuguese (ID 163)	93H8141
	Keyboard, Romania	1399582
	Keyboard, Romania (ID 446)	93H8142
	Keyboard, Russian	1399579
	Keyboard, Russian (ID 443)	93H8143
	Keyboard, Serbian (ID 118)	93H8144
	Keyboard, Slovak	1399571
	Keyboard, Slovak (ID 245)	93H8145
	Keyboard, Spanish	1391405
	Keyboard, Spanish (ID 171)	93H8123
	Keyboard, Spanish (ID 172)	93H8146
	Keyboard, Sweden/Finland (ID 153)	93H8147
	Keyboard, Swiss-French	1395881
	Keyboard, Swiss French/German (ID 150)	93H8148
	Keyboard, Swiss-German	1395882
	Keyboard, Thailand (ID 191)	93H8157
	Keyboard, Turkish (ID 179)	1393286
	Keyboard, Turkish (ID 179)	93H8149
	Keyboard, Turkish (ID 440)	8125409
	Keyboard, Turkish (ID 440)	93H8150
	Keyboard, U.K. English	1391406
	Keyboard, Turkish (ID 166)	93H8151
	Keyboard, US English ISO9995 (ID 103P)	93H8153
	Keyboard, 106 Japan (ID 194)	93H8154
	106 keys International keyboard problem keyboard, Chinese keyboard, Japanese-Kanji Japanese, Enhanced keyboard, Korean keyboard, Taiwanese	1392090 79F0167 66G0507 06H5286 02G7353
	Lighted program function keyboard (LPFK), 6094 model 20 cable, serial attachment, power	39F8226 39F8302
	Keyboard, English	10N6956
	Keyboard, French (id 189)	10N6957

Table 70. Keyboard parts (continued)

CCIN	Description	Part number
	Keyboard, French (id 142)	10N6958
	Keyboard, German	10N6959
	Keyboard, UK English (id 166)	10N6960
	Keyboard, Spanish (id 172)	10N6961
	Keyboard, Japanese (id 184)	10N6962
	Keyboard, Brazilian Portuguese (id 275)	10N6963
	Keyboard, Canadian French (id 58)	10N6968
	Keyboard, Belgium Dutch (id 120)	10N6969
	Keyboard, Swedish Finnish (id 153)	10N6970
	Keyboard, Danish (id 159)	10N6971
	Keyboard, Bulgarian (id 442)	10N6972
	Keyboard, Swiss French German (id 150)	10N6973
	Keyboard, Norwegian (id 155)	10N6974
	Keyboard, Portuguese (id 163)	10N6976
	Keyboard, Greek (id 319)	10N6977
	Keyboard, Hebrew (id 312)	10N6978
	Keyboard, Hungarian (id 208)	10N6964
	Keyboard, Polish (id 214)	10N6979
	Keyboard, Slovakian (id 245)	10N6980
	Keyboard, Czechoslovakian (id 245)	10N6981
	Keyboard, Turkish (id 179)	10N6982
	Keyboard, Spanish (id 171)	10N6983
	Keyboard, Arabic (id 238)	10N6984
	Keyboard, Korean (id 413)	10N6965
	Keyboard, Chinese (id 467)	10N6966
	Keyboard, French Canadian (id 445)	10N6967
	Keyboard, Thailand (id 191)	10N6985
	Keyboard, Russian (id 443)	10N6986
	Keyboard, Yugoslavian Latin (id 105)	10N6987
	Keyboard, English (EMEA) (id 103P)	10N6988
	Keyboard, Dutch	10N6975
	Keyboard	40K9430
	Keyboard	40K9430
	Keyboard	32N1205
	Keyboard, French	32N1206
	Keyboard, Italy	32N1207
	Keyboard, Germany and Austria	32N1208
	Keyboard, UK English	32N1209
	Keyboard, Spanish	32N1210
	Keyboard, Japan	32N1211

Table 70. Keyboard parts (continued)

CCIN	Description	Part number
	Keyboard, Brazil	32N1212
	Keyboard, Hungry	32N1213
	Keyboard, Korea	32N1214
	Keyboard, China	32N1215
	Keyboard, French Canadian	32N1216
	Keyboard, French Canadian	32N1217
	Keyboard, Belgium and UK	32N1218
	Keyboard, Sweden and Finland	32N1219
	Keyboard, Danish	32N1220
	Keyboard, Bulgaria	32N1221
	Keyboard, Swiss, French, and German	32N1222
	Keyboard, Norwegian	32N1223
	Keyboard, Hebrew	32N1227
	Keyboard, Poland	32N1228
	Keyboard, Slovakian	32N1229
	Keyboard, Czechoslovakia	32N1230
	Keyboard, Turkey	32N1231
	Keyboard, Latin Spanish	32N1232
	Keyboard, Arabic	32N1233
	Keyboard, Thailand	32N1234
	Keyboard, Russia	32N1235
	Keyboard, Slovakian	32N1236
	Keyboard, English Europe	32N1237

Table 71. Miscellaneous parts

CCIN	Description	Part number
	Removable media	See <i>Managing Devices</i> SA76-0107
	External cables and cords	Refer to <i>Site and Hardware Planning Guide</i> SA76-0091
	Black mouse	03N6669
	Wrap plug	12R9314 12R9315 42R4761 6165899 73H2508 87H3311 87H3439 87H3442 93H5270 03N6070
	PCI cassette assembly	42R4190
	Battery kit	09J8199

Table 71. Miscellaneous parts (continued)

CCIN	Description	Part number
	FSP card	10N9907
	Fan control card	11K1107

Appendix. Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features

The following list includes the major accessibility features:

- Keyboard-only operation
- Interfaces that are commonly used by screen readers
- Keys that are tactilely discernible and do not activate just by touching them
- Industry-standard devices for ports and connectors
- The attachment of alternative input and output devices

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